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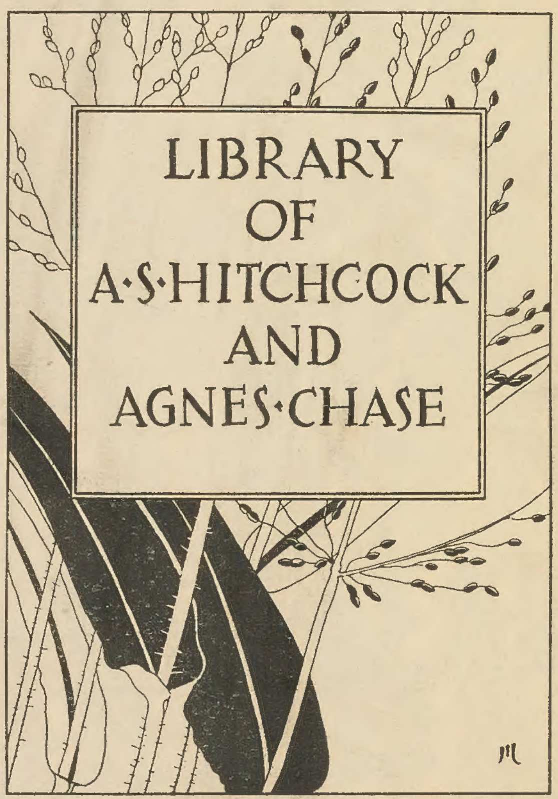

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Elysium Marianum

FERNS AND FERN ALLIES

Second Edition

WASHINGTON, D. C.
1907

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PREFACE

There is perhaps no study which gives a greater pleasure to the mind than does botany in all its details. No study has a more elevating and refining influence when pursued for its own sake than this inexhaustible subject, based as it is upon an infinite number of forms –expressions of beauty, use and wisdom.

The forms appeal to us first; their study and natural grouping should therefore claim our earlier attention, while a knowledge of their anatomy and their very nature should be acquired as a necessary complement in order to get a truer view of plant-life.

Omnis vera cognitio cognitione specifica innitatur. (Linnaeus). This is true and it should lead us to the study of our plants in their native haunts. Valuable as is a knowledge, gained by others and handed down to us in literature; yet the best knowledge is acquired through the things themselves.

A knowledge of plant-life has its own reward: *si ad naturam vives*, *numquam eris pauper*: *si ad opiniones*, *numquam eris dives*. [*Epicurus*; Seneca, Epist. 16] The aid it gives to the philosophic mind is inestimable as nature is the only rational basis for philosophy.

How much easier it is to appreciate the Good, the Beautiful and the True about us, when we have some knowledge –be it ever so small– of plant-life and its innumerable and beautiful forms. The words of the Psalmist: "*Coeli enarrant gloriam Dei, et opera manuum ejus annunciat firmamentum*" are in an equal measure applicable to *Flora's* realm.

This little volume is designed as an aid in a preliminary determination of a limited number of plants, indiginous to Maryland and Virginia. The works cited in connection with the species are the most recent accessible books on our flora; these should be consulted in critical determinations, as should also the various botanical journals, published in the Eastern United States. A comprehensive bibliography has been given by *W. R. Maxon* in his "*List of the Ferns and Fern Allies of North America North of Mexico with Principal Synonyms and Distribution.*" [Proc. U. S. Nat. Mus. 23: 619-651. 1901.]

With the exception of a few species, these notes are primarily the result of field-studies, more or less interrupted since 1896. The material in the U. S. National Herbarium has been consulted in order to include all known localities for some of the rarer species.

I am indebted to *Mr. F. J. Tyler* for the illustrations and indirectly to all my co-workers, whose names appearin connection with some of the species.

Washington, D. C. *Ivar Tidestrom.*

I stooped and picked a leaf of fern,
And recollected I might learn
From books, how many myriad sorts
Of fern exist, to trust reports,
Each as distinct and beautiful
As this, the very first I cull.
Think, from the first leaf to the last!
Conceive, then, earth's resources! Vast
Exhaustless beauty, endless change
Of wonder! . . . .

Browning

Key to the Genera.

Leaves ample.

Terrestrial plants.

Leaves divided into one fertile and one sterile segment.

Segments undivided, plants 1--3 dm. high; sporophyll a distichous spike. *1. Ophioglossum.*

Segments divided, sporophyll pinnate to 3-pinnate. *2. Botrychium.*

Leaves bearing sporecases upon branched pinnae without parenchyma.

Plants trailing; leaf-segments 4--7-palmatifid. *3. Lygodium.*

Plants robust, erect, 6--20 dm. high. *4. Osmunda.*

Sporecases forming sori on the lower side of the leaf.

Sori without indusia; rootstocks creeping.

Leaves pinnatifid.

a. glabrous *5. Polypodium.*
b. scaly. *6. Marginaria.*

Leaves triangular, 2--pinnatifid. *7. Phegopteris.*

Sori borne upon a revolute portion of the leaf-margin; stipes straw- or dark-colored.

DSI

Leaves ample.

Leaves ternate, branches 2-pinnate. *8. Pteridium.*

Leaves pinnate, 2-pinnate below. *9. Pellaea.*

Leaves 2-pinnate, pinnules pinnatifid. *10. Cheilanthes.*

Leaves decompound, pinnules triangular-oblong. *11. Adiantum.*

Sori forming chainlike rows parallel to the midrib or central vein of the pinnules.

Leaves uniform, pinnate-pinnatifid. *12. Anchistea.*

Leaves of two kinds, fertile leaves pinnate, pinnae linear; sterile leaves deeply pinnatifid. *13. Lorinseria.*

Sori linear or oblong, along the veins or scattered.

Leaves various, veins free.

Sori straight. *14. Asplenium.*

Sori sometimes curved; leaves pinnate to 2-pinnate. *15. Athyrium.*

Leaves simple, veins united; sori scattered. *16. Camptosorus.*

Sori orbicular.

Indusium superior; plants robust.

Indusium peltate; leaves pinnate. *17. Polystichum.*

Leaves ample.

Terrestrial plants.

Indusium reniform; leaves 2--3-pinnate. *18. Dryopteris.*

Indusium partly superior; leaves 2--3-pinnate; plants delicate. *19. Filix.*

Indusium inferior; leaves 2-pinnate, glandular pubescent; pinnae distant, divaricate. *20. Woodsia.*

Indusium cup-shaped; leaves 3-pinnatifid. *21. Dennstaedtia.*

Leaves of two kinds; sporophylls 3--7 dm. high, pinnate, segments closely rolled together.

Sterile leaves 2-pinnatifid, 6--20 dm. high. *22. Matteuccia.*

Sterile leaves triangular, pinnatifid. *23. Onoclea.*

Aquatic plants.

Leaves long-petioled, 4-foliolate. *24. Marsilia.*

Leaves linear, rigid; stem corm-like; plants small, sporangia axillary. *25. Isoetes.*

Leaves minute or rudimentary.

Plants robust, rush-like; stems hollow-jointed, simple or with verticillate branches. *26. Equisetum.*

Plants small, moss-like, erect or trailing.

Spores uniform. *27. Lycopodium.*

Spores of two kinds. *28. Selaginella.*

1. OPHIOGLOSSUM Trag. 1551.

Lingua serpentina Latinis, Graecis οφὶογλῶσσον & *Germanis Naterzuenglin, a forma sua* . . . Tragus, Hist. 323. fig.

Rootstocks erect with numerous fleshy roots. Sterile leaf-segments entire, lanceolate, ovate or rotund. Spore-cases connate, forming a two-ranked spike.

† *Sterile segment obtuse.*

1. O. vulgatum L. Pl. 1.

Ophioglossum radice repente. Gron. 1743. Fl. Virg. 196.

Ophioglossum vulgatum L. 1753. Sp. Pl. 1062. *Eaton*, 1880. Ferns N. Am. 2: 261. t. 81. f. 1-4; 1889. in Gray Man. 695. *Underw.* in Ill. Fl. 1: 2; 1900. Nat. Ferns ed. 6. 66; 1901. in Britt. Man. 2. *Clute*, 1901. Ferns 45. t. 1. *Waters*, 1903. Ferns 25. 341.

ADDER'S TONGUE.

Plants 1--3 dm. high; sterile leaf-segment ovate-elliptic, 3--10 cm. long, inserted below the middle of the petiole; spike 2--4 cm. long.

In meadows and woods, rare.

This plant was used by the ancients in the healing of wounds; hence the Swedish word *Læketunga* "healing-tongue."

†† *Sterile segment mucronate.*

2. O. Engelmanni Prantl.

Ophioglossum Engelmanni Prantl, 1884. Jahr. Koenigl. bot. Gart. Berlin 3 : 318. t. 7. f. 17. *Underw.* 1898. in Ill. Fl. 3 : App. 494. f. 1a; Nat. Ferns 67; in Britt. Man. 2.

O. vulgatum Engelmanni Clute, l. c. 48, 316. *Waters*, l. c. 343.

ADDER'S TONGUE.

Plants 1--2 dm. high; sterile leaf-segment elliptic-lanceolate.

Staunton, Va., *W. A. Murrill.*

Ophioglossum Mariana lingua dentata [Plukenet, in Phil. Trans. 1698. 398.] collected by the Rev. Mr. *H. Jones* in Maryland is undoubtedly the small form of *O. vulgatum.*

2. BOTRYCHIUM Swartz, 1801.

βότρυδον racematim l. in modum racemi . . Gemma incipienti uvae similis Plini 37. 10. Sw. Schrad. Jour. Bot. 1800 : pt. 2. 110.

Succulent plants. Rootstock erect with many fleshy rootlets. Sterile leaf-segments various; fertile segments pinnate to 3-pinnate or paniculate.

† *Sterile leaf-segment ternate, sessile.*

1. B. virginianum (L.) Sw. Pl. 1.

Osmunda fronde pinnatifida caulina, fructificationibus spicatis . . Gron. Fl. Virg. 196.
Osmunda virginiana L. Sp. Pl. 1064.
Botrychium virginianum Sw. l. c. 111. *Eaton,* 1878. Ferns N. Am. 1 : 253. t. 33 ; in Gray Man. 695. *Underw.* in Ill. Fl. 1 : 4 ; Nat. Ferns 74 ; in Britt. Man. 4. *Clute,* Ferns 41. ff. *Waters,* Ferns 25, 337.

VIRGINIAN GRAPE FERN.

Plants 2--6 dm. high ; the divisions of the ternate leaf-segment 2-pinnate ; sporophyll 2--3-pinnate, long-stalked, sometimes forking near its middle forming two panicles ; pinnules of the sterile segment are occasionally spore-producing. [Torreya 5 : 160. f. 1.]

Frequent in rich woods. June-August. A slender form [*B. gracile Pursh,* 1814. Fl. Am. Sept. 2 : 656.] is found occasionally with the type.

†† *Sterile leaf- segment ternate, stalked.*

* *Pinnules obliquely ovate or oblong-lanceolate.*

2. B. obliquum Muhl. Pl. 1.

Lunaria multifido folio . . crasso ex Terra Mariana . . Pluk. 1700. Mant. 120. t. 427. f.7.
Botrychium obliquum Muhl. ; Willd. 1810. Sp. Pl. 5 : 63. *Underw.* Nat. Ferns 72 ; in Britt. l. c. 3. *Clute,* l. c. 54. *Waters,* l. c. 327.

B. obliquum

B. ternatum var. obliquum Eaton, l. c. 1 : 149. t. 20. f. 2; in Gray l. c. 694. *Underw.* in Ill. Fl. 1 : 3.

GRAPE FERN.

Plants 2--5 dm. high; the divisions of the ternate, sterile leaf-segment 2-pinnatifid or 2-pinnate; pinnules obliquely ovate, the terminal one elongate, margins crenulate: sporophyll long-stalked, 2--3-pinnate.

In low, damp woods. July-September.

** *Pinnules dissected.*

3. **B. dissectum** Spreng. Pl. 1.

Lunaria Botryitis ramosa, Geranii moschati foliis . . Pluk. 1705. Almath. 134. t. 427. f. 5.

Botrychium dissectum Spreng. 1804. Anl. 3 : 172. *Underw.* in Ill. Fl. 3: App. 494. f. 4a; Nat. Ferns 72; in Britt. l. c. 3.

B. ternatum var. dissectum Eaton, l. c. 150. t. 20; in Gray l. c. 694. *Underw.* in Ill. Fl. 1 : 3.

B. obliquum dissectum Clute, l. c. 57, 315. *Wat.* l. c. 332.

GRAPE FERN.

Plants 2--6 dm. high; the divisions of the sterile leaf-segment dissected into numerous narrow lobes.

In low, damp woods. July-September.

††† *Serile leaf-segment pinnatifid to 2-pinnate.*

4. B. neglectum Wood Pl. 3.

Botrychium neglectum Wood, 1846. Class-book 635. *Underw.* in Britt. l. c. 1037; Nat. Ferns 70.
B. matricariaefolium of Amer. authors. *Eaton*, l. c. 129. t. 17. ff. 9--14; in Gray l. c. *Underw.* in Ill. Fl. 1: 3. *Clute*, l. c. 60. *Waters*, l. c. 322.

Crape Fern.

Plants 0.5--2 dm. or higher; the sterile segment very variable, borne above the middle of the petiole, the ultimate divisions lobed or entire; sporophyll 2-pinnatifid, the lowest branches nearly equalling the central one.

Towson, Md., *Waters*; Washington, *Mrs. Steele.*

†††† *Sterile leaf-segment palmately divided.*

5. B. lanceolatum (S. G. Gmelin) Angstr.

Osmunda lanceolata Gmel. 1768. Nov. Com. Ac. Petrop. 12: 516. t. 11. f. 2.
Botrychium lanceolatum Angstr. 1854. Bot. Not. 68. *Eaton*, l. c. 1: 33. t. 5.; in Gray l. c. 694. *Under.* in Ill. Fl. 1: 4; Nat. Ferns 71; in Britt. l. c. 3. *Clute*, l. c. 59. *Waters*, l. c. 320.

Grape Fern.

Plants 1 dm. or higher; the divisions of the sterile segment pinnate--2-pinnatifid, spreading, lobes acute; midveins of the divisions continuous; fertile segment short-stalked, slightly exceeding the sterile one, 2--3-pinnate.

Wiele, Va., *Paul Bartsch.*

Botrychium virginianum was according to Hoffman [7th Ann. Rep. Bur. Ethn. 201. 1901.] used by the medicine men of the Ojibwa Indians in the healing of cuts. *B. obliquum* may have had a similar use among the aborigines. In Pre-Linnean times *B. lunaria* was used in a like manner according to *Matthioli* [Epit. 643. 1586.] who speaks of it as follows: *Vulneraria est planta, efficax'q; vulneribus recentibus glutinandis.*

3. LYGODIUM Swartz, 1801.

Nomen a λυγοδες *flexilis, tortuosus.* Sw. in Schrad. Journ. Bot. 1800: pt. 2. 106.

Trailing plants. Rootstock slender, creeping. Lower pinnae of the leaf sterile; the upper ones fertile. Spore-cases borne in a double row on the linear lobes of the pinnules.

1. L. palmatum (Bernh.) Sw. Pl. 1.

Gisopteris palmata Bernh. Schrad. l. c. 129.

Lygodium palmatum Sw. 1806. Syn. Fil. 154. *Eaton*, 1877. Ferns N. Am. 1: 1. t. 1; in Gray Man. 692. *Underw.* in Ill. Fl. 1: 7; Nat. Ferns 75; in Britt. Man. 6. *Clute*, Ferns 280. *Waters*, Ferns 292.

CLIMBING FERN.

Lower pinnae dichotomously forked; pinnules 4--6-palmatifid, lobes oblong, obtuse; fertile pinnae several times forked, ultimate divisions palmatifid.

In moist woods, rare. July-October.

4. OSMUNDA Lobel. 1570.

This name seems to be of French origin. "*Vulgo Osmunda in Belgio dicitur*" . . (Dodon. Hist. 461. 1583.) . . "*a Gallis Osmunde*" . . (Dalech. Hist. 1225. 1586.) *The plant was possibly named in honor of St. Osmonde one of the followers of William the Conqueror, and afterwards bishop of Salisbury.*

Robust plants growing in large clusters. Rootstock ascending or nearly erect. Leaves 2-pinnatifid to 2-pinnate.

† *Leaves 2-pinnate, upper portion fertile.*

1. O. regalis L. Pl. 2.

Filix Virginiana, non dentata, florida, foliis alternis . . *Pluk.* 1692. Phyt. t. 181. f 4.
Filix florida, seu Osmunda regalis . . . *Gron.* Fl. Virg. 123.
Osmunda regalis L. Sp. Pl. 1065. *Eaton*, 1878. Ferns N. Am. 1 : 209. t. 28; in Gray Man. 693. *Underw.* in Ill. Fl. 1 : 5; Nat. Ferns 77; in Britt. Man. 4. *Clute*, Ferns 32. *Waters*, Ferns 298.

OSMUND THE WATERMAN. ROYAL FERN.

Plants 1 m. or higher; rootstock stout, bearing a cluster of 2-pinnate leaves; pinnules oblong or lanceolate-oblong, sessile or nearly so, very variable.

In wet, shaded places. May-August.

†† *Leaves 2-pinnatifid.*

* *2 to 5 of the middle pairs of pinnae fertile; pinnae without an axillary tomentum.*

2. O. Claytoniana L.

Osmunda Claytoniana L. l. c. 1066. *Eaton*, l. c. 1 : 219. t. 29. ff. 1, 2 ; in Gray l. c. 693. *Underw.* in Ill. Fl. 1 : 6 ; Nat. Ferns 77 ; in Britt. l. c. 4. *Clute*, l. c. 30. *Waters*, l. c. 303.

CLAYTON'S FERN.

Plants 6--12 dm. high ; leaves oblong-lanceolate, the pinnae 0.5 to 1.5 dm. long, the ultimate divisions rounded ; fertile leaves somewhat taller than the sterile ones ; sporebearing pinnae reduced.

In moist woods. May-July.

** *Fertile leaves distinct, sterile pinnae with an axillary tomentum.*

3. O. cinnamomea L. Pl. 3.

Filix botryitis Virginiana . . Moris. 1699. Hist. 3 : 593. sect. 14. t. 4. f. 3.

Osmunda arborea . . surculis semeniferis radicalibus. Gron. l. c. 2 : 196.

O. cinnamomea L. l. c. *Eaton*, l. c. 227. t. 29. ff. 3--5 ; in Gray l. c. 693. *Underw.* in Ill. Fl. 1 : 5 ; Nat. Ferns 77 ; in Britt. l. c. 4. *Clute*, l. c. 25. *Waters*, l. c. 307.

CINNAMON FERN.

Plants 5--18 dm. high, clothed with a rusty tomentum when young; sterile leaves clustered; pinnae linear-lanceolate; fertile leaves 2-pinnate; sporecases cinnamon-colored.

In swamps and shaded woods. May-June.

O. cinnamomea frondosa Eaton, [in Gray l. c.] with the lower pinnae sterile and the upper sporebearing, has been observed at Laurel, Md., by *Pollard*; and var. *glandulosa Waters*, [Fern Bull. 10: 21.] by *Maxon and Waters.*

O. regalis was used extensively in medicine in Pre-Linnean times. *Radix Osmundae regalis* and *Medulla radicis Osmundae* were used in various ways by the earlier herbalists.

In the land of *Osmundr* this handsome fern is known by the name of *Safsa-Busken. Linnaeus* [It. sc. 40. 1751.] mentions a certain famous *medicine-woman*, who used to go to this "bush", in silence and fasting to invoke the aid of whom —he did not know. This species is evidently one of the many plants to which the people of ages ago attributed some magic power or about which hovered some Genius, evil or good.

The Virginian plant was distinguished by *Linnaeus* as *Osmunda regalis β.* and by *Willdenow* as *Osmunda spectabilis.* [Sp. Pl. 5: 98. 1810.]

5. POLYPODIUM Theophrastus.

Polypodium a vocibus Graecis πολυ *multum &* πους *Pes, quasi diceretur planta multipes, ob radicum formam. Tournefort*, 1700. Inst. 541.

Rootstock creeping, scaly. Leaves various. Spore-cases borne in sori without indusia.

1. P. virginianum L.

Polypodium minus alterum? Banister; Ray, Hist. 2: 1926. 1688.

P. virginianum L. Sp. Pl. 1085. (excl. syn.)

P. vulgare auct. non *L. Eaton*, Ferns N. A. 1: 237. t. 31. ff. 1--3; in Gray Man. 680. *Underw.* in Ill. Fl 1: 32; Nat. Ferns 82; in Britt. Man. 7. *Clute*, Ferns 196. *Waters*, Ferns 77.

WALL FERN, POLYPODY.

Plants 1–2.5 dm. high; leaves deeply pinnatifid; sori large, situated midway between the margin and the midrib.

In rocky places.

In its outward appearance this species differs in no appreciable degree from *P. vulgare.* The latter species is characterized by having from 3 to 5 *stelai* at the base of the petiole, while in our plant the number is commonly 2, and in older leaves 3, –2 being normal and 1 is smaller.

The rootstocks of *P. vulgare* were used in the art of medicine by the ancients: *radix in usu* . . (Plin. Hist. 26: 58.). In Scandinavia they are much appreciated by the children, who delight in gathering *stensoeta.*

6. MARGINARIA Bory, 1824.

Rootstock creeping, scaly. Leaves various, lower face densely scaly. Sori marginal without indusia.

1. M. polypodioides (L.) Tm. Pl. **1.**

Filix s. Polypodium . . . *Virginianum. Pluk.* 1696. Alm. 153. Phyt. t. 289. f. 1.

Acrostichum fronde pinnata . . *Gron.* Fl. Virg. 2: 198.

A. polypodioides L. Sp. Pl. 1068.

Polypodium incanum Sw. 1788. Prod. 131. *Eat.* Ferns 1: 197. t. 26. f. 2; in Gray Man. 680. *Clute*, Ferns 198.

P. polypodioides A. S. Hitchcock, 1893. Rep. Missouri Bot. Gard. 156. *Underw.* in Ill. Fl. 1: 33; Nat. Ferns 82; in Britt. Man. 7. *Waters*, Ferns 83.

Marginaria polypodioides Tm. 1895. Torreya 5: 171.

Plants 0.5—2 dm. high; leaves nearly pinnate, coriaceous, thickly covered on the lower side with grayish scales.

On rocks or trees.

7. PHEGOPTERIS Fee, 1851.

Mot a mot fougere du hetre. Ce genre a pour le type Phegopteris des auteurs (φηγός, hetre; πτερὶς fougere) Fee. 1851. Gen. Fil. 361.

Rootstock slender, creeping. Leaves triangular, 2–3-pinnatifid or ternate. Sporecases in sori without indusia.

† *Leaves triangular, 2-pinnatifid.*

* *Leaves broader than long.*

1. P. hexagonoptera (L. C. Rich.) Fee.

Filix mas rachi seu nervo medio alato. Banister; Ray, Hist. 2 : 1926.

Polypodium hexagonopterum L. C. Rich.; Mich. Fl. 2 : 271.

Phegopteris hexagonoptera Fee, l. c. 243. *Eaton*, Ferns N. A. 2 : 147. t. 65; in Gray Man. 686. *Underw.* in Ill. Fl 1 : 19; Nat. Ferns 109; in Britt. Man. 16. *Clute*, Ferns 202. *Waters*, Ferns 189.

BEACH FERN.

Plants 3 dm. or higher; leaves nearly equilaterally triangular; pinnae adnate to the rachis, the lowermost sometimes 1 dm. l., lanceolate, with crenate-dentate segments; segments of the upper pinnae denticulate or entire; sori small, near the apices of the free veinlets.

In open, dry woods. June-August.

** *Leaves longer than broad.*

2. P. connectilis (L. C. Rich.) Watt.
Polypodium phegopteris L. Sp. Pl. 1089.
P. connectile L. C. Rich.; Michx. Fl. 2: 271.
Phegopteris polypodioides Fee, l. c. 243. *Eaton*, l. c. 2: 217. t. 75; in Gray l. c. 686. *Clute*, l. c. 200. *Waters*, l. c. 184.
P. phegopteris Underw.; Small, Bull. Torr. Cl. 20: 462. *Underw.* in Ill. Fl. 1: 19; Nat. Ferns 108; in Britt. l. c. 16.
P. connectilis Watt, 1869. Canad. Nat. Ser. 2. 4: 363.

BEACH FERN.

Plants 3 dm. or higher; leaves pubescent on the veins below; lowermost pinnae less than 1 dm. long, segments entire or nearly so.

In recent Manuals this fern is reported growing as far south as the mountains of Virginia. I have collected it in Vermont where it is common. I have seen specimens from Watkin's Glen, N. Y., and Ganoga Lake, Pa.

†† *Leaves ternate.*

3. P. dryopteris (L.) Fee. Pl. 4.
Polypodium dryopteris L. l. c. 1093.
Phegopteris dryopteris Fee, l. c. 243. *Eaton*, l. c. 1: 157. t. 21; in Gray l. c. 686. *Underw.* in Ill. Fl 1: 19; Nat. Ferns 109; in Britt. l. c. 17. *Clute*, l. c. 203. *Waters*, l. c. 194.

OAK FERN.

Plants 3 dm. or higher; the divisions of the ternate leaf 2-pinnatifid; pinnae sessile or nearly so; segments rounded.

Stony Man Mountain, Va., *W. Palmer* and *King*.

8. PTERIDIUM Scopoli, 1760.

The name Pteridion was applied by Valer. Cordus [Hist. de Plantis 2: 170. 1561.] *to Phegopteris dryopteris. The ancient name for the Eagle Fern was without doubt Thelypteris.*

Rootstock creeping, blackish. Leaves usually ternate. Sporecases borne in sori upon a revolute portion of the leaf-margin. Indusium membranous.

1. P. aquilinum (L.) Kuhn.

Filix foemina, foliis per margines pulverulentes . . Banister; Ray, Hist. 2: 1928.

Pteris fronde supradecomposita . . Gron. Fl. 2: 197.

Pteris aquilina L. Sp. Pl. 1075. *Eaton*, Ferns 1: 263. t. 35; in Gray Man. 681. *Underw.* in Ill. Fl. 1: 28. *Clute*, Ferns 69. *Waters* Ferns 93.

Pteridium aquilinum Kuhn, 1879. in Decken's Reis. 3: 11. *Underw.* Nat. Ferns 91; in Britt. Man. 8.

EAGLE FERN, BRACKEN.

Plants 5–20 dm. or higher; leaves ovate-triangular or ternate 2–3-pinnate at the base; pinnules lobed or entire.

In sunny places. Summer.

The rootstocks of this species were used as food by the northern Indians *(Dr. E. Palmer)*; in Japan the rootstocks and young leaves are used in a similar manner *(Duchesne)*; in Europe the leaves are used for bedding; the plant was formerly used in obtaining potash.

9. PELLÆA Link, 1841.

Stipes rigidus badius unde Pellaeam dixi. Link, Fil. Hort. Berol. 59.

Rock-loving ferns. Rootstock short, ascending or slender, creeping. Leaves pinnatifid–3-pinnate, stipes dark-colored. Sori borne along the revolute portion of the leaf-margin.

1. P. atropurpurea (L.) Link. Pl. 3.

Filicula saxatilis Osmunda facie . . sive Adiantum Marianum . . Pluk. Mant. 81. t. 349.

Pteris Adianti facie caule, ramulis petiolisque politiore nitore nigricantibus . . . Gron. Fl. 2: 197.

Pteris atropurpurea L. Sp. Pl. 1076.

Pellaea atropurpurea Link, l. c. *Eaton*, Ferns N. Am. 2: 61. t. 54. ff. 4–7; in Gray Man. 682. *Underw.* in Ill. Fl. 1: 29; Nat. Fern. 98; in Britt. Man. 9. *Clute*, Ferns 84. *Waters*, Ferns 113.

CLIFF BRAKE.

Plants 1–4 dm. high; leaves pinnate, 2-pinnate below; pinnae linear-oblong, 1–4 cm. long, 1 cm. or less wide; stipes dark-brown.

In crevices of rocks. July-September.

10. CHEILANTHES Swartz, 1806.

Nomen a χεῖλος, *Margo et* ανθός, *Flos. Sw.* Syn. 126.

Rock-loving ferns, growing usually in clusters. Rootstock short, sometimes stout. Leaves 2–3-pinnate. Indusia confluent or distinct.

† *Leaves 2-pinnate, glabrous or nearly so.*

1. C. alabamensis (Buckl.) Kunze.

Pteris alabamensis Buckl. 1843. Am. Journ. Sc. 45: 177.

Cheilanthes alabamensis Kunze, Linnaea 20: 4. *Eaton*, Ferns N. Am. 2: 89. t. 57. ff. 7--9; in Gray Man. 681. *Underw.* in Ill. Fl 1: 30; Nat. Ferns 93; in Britt. Man. 9. *Clute*, Ferns 242. *Waters*, Ferns 98.

ALABAMA LIP FERN.

Plants 1 dm. or higher; leaves lanceolate, 2-pinnate below, 2-pinnatifid or pinnate towards the apex; pinnae ovate– or oblong-lanceolate, 0.5--2 cm. long, pinnules oblong, variously toothed or entire; stipes slender, wiry, blackish.

Reported from the mountains of Virginia. I have seen specimens from the mountains of North Carolina and Tennessee, but none from Virginia.

†† *Leaves 2-pinnatifid, hirsute.*

2. C. lanosa (L. C. Rich.) Watt. Pl. 2.

Nephrodium lanosum L. C. Rich.; Michx. Fl. 2: 270.

Cheilanthes vestita Sw. l. c. 128. *Eaton*, l. c. 1: 13. t. 2. f. 2; in Gray l. c. 681. *Clute*, l. c. 237. *Waters*, l. c. 100.

C. lanosa Watt, 1874. Journ. Bot. 12: 48. *Underw.* in Ill. Fl. 1: 31; Nat. Ferns 93; in Britt. l. c. 9.

HAIRY LIP FERN.

Plants 1–2.5 dm. high, growing in cluster; leaves oblong-lanceolate, pinnae ovate-lanceolate, 1–2 cm. long, pinnules rather distant.

In crevices of rocks. July-August.

††† *Leaves 3-pinnate, tomentose.*

3. C. tomentosa Link.

Cheilanthes tomentosa Link, 1833. Hort. Ber. 2: 42. *Eaton*, l. c. 1: 345. t. 45. ff. 1–5; in Gray l. c. 681. *Underw.* in Ill. Fl. 1: 31; Nat. Fern. 94; in Britt. l. c. 10. *Clute*, l. c. 239. *Waters*, l. c. 108.

WOOLLY LIP FERN.

Plants 1–4 dm. high, more or less beset with a brown tomentum; leaves linear-lanceolate; pinnae ovate-lanceolate, rather distant, 1–3 cm. long; secondary pinnae oblong, 1 cm. or less in length; pinnules minute.

In crevices of rocks.

Reported from the mountains of Virginia. I have seen this fern in the mountains about Chattanooga, Tenn.

11. ADIANTUM Theophr.

Adianton autem ex eo dicitur, quod folium, ut Theophrastus ait, non madescat: . . . Dodonaeus, 1583. Stirp. Hist. 466.

Handsome ferns preferring rocky woods Leaves various; stipes brown or dark-colored. Sporecases borne at the end of the free veinlets and covered by a reflexed portion of the leaf-margin.

† *Leaves dichotomously forked.*

1. A. pedatum L. Pl. 5.

Adianthum fruticosum americanum . [e Virginia, John Tradescant] *Parkinson*, 1640, Theat. Bot. 1049. f. 3.

Adiantum fronde supra decomposita bipartita . *Gron*. Fl. Virg. 123.

A. pedatum L. Sp. Pl. 1095. *Eaton*, Ferns 1 : 135. t. 18; in Gray Man. 680. *Underw.* in Ill. Fl. 1 : 27; Nat. Ferns 90; in Britt. Man. 8. *Clute*, Ferns 242. *Waters*, Ferns 88.

MAIDENHAIR FERN.

Plants 3 dm. or higher; leaves dichotomously forked or decompound; pinnules or ultimate divisions triangular-oblong, 3 cm. or less in length.

In rich, deciduous woods. Summer.

†† *Leaves with a continuous rachis.*

2. A. Capillus-Veneris L. Pl. 5.

Adiantum Capillus-Veneris L. l. c. 1096. *Eaton*, l. c. 1 : 281. t. 37; in Gray l. c. 680. *Underw.* in Ill. Fl. 1 : 27; Nat. Ferns 89; in Britt. l. c. 7. *Clute*, l. c. 246. *Waters*, l. c. 91.

MAIDENHAIR FERN.

Plants 4 dm. or higher; leaves ovate-lanceolate; pinnae alternate; pinnules wedge-obovate, irregularly incised.

Reported from Southern Virginia. I have seen no specimens from regions north of Wilmington, N. C.

The leaves of *A. Capillus-Veneris* have been used in medicine from time immemorial; they are known in pharmacy as *Herba Capillorum Veneris s. Folia Capilli* and were used in making a sirup (*Syrupus Capillorum*).

Adiantum pedatum (see Linn. Spec. p. 1095.) was also one of the plants in which a flourishing trade is carried on by Canada. *Cornut* in his *Canadens. plant. hist.* p. 7. calls it *Adiantum americanum*; it is also described and illustrated on p. 6. In Canada the plant is called mostly *Herba capillaris*, and *Maidenhaire* by the *English* in their *colonies*. It grows in abundance in all the English provinces through which I have journeyed; it is just as frequent in Southern Canada, but I have never observed it about Quebec. It thrives particularly in shady forests and in rather rich soil. Several people in Albany and Canada told me that its [leaves] were much used instead of "tea" against consumption, coughs and all lung-diseases. They have learnt this from the savages who have used this for these purposes from time immemorial. . . . . The savages went about in the woods in great numbers, journeyed far above Montreal searching for this plant.

Translated from *Kalm's Res. Nor. Am.* 3: 338. 1761.

12. ANCHISTEA Presl, 1849.

Nomen derivatum ab αγχιστεὂς *agnatus, affinitatem cum Woodwardia et Doodia indicans.* Presl, Epimel. Botanica 71.

Robust ferns. Rootstock long, creeping. Leaves of one kind. Sori oblong, in rows along the midrib of the pinnae and the central vein of the lobes.

1. A. virginica (L.) Presl.

Filix mas vulgari similis . . *Pluk.* Phyt. t. 179. f. 2.

Blechnum virginicum L. 1771. Mant. 2: 307.

Woodwardia virginica J. E. Smith, 1793. Mem. Acad. Turin 5: 412. *Eaton*, Ferns N. Am. 2: 45. t. 52; in Gray Man. 683. *Underw.* in Ill. Fl. 1: 20; Nat. Ferns 102; in Britt. Man. 10. *Clute*, Ferns 219. *Waters*, Ferns 121.

Anchistea virginica Presl, l. c.

VIRGINIAN CHAIN FERN.

Plants 5–10 dm. high; leaves 2-pinnatifid; pinnae alternate, lanceolate, 0.5–1.5 dm. long; sori at length confluent.

In moist woods and swamps. Summer.

13. LORINSERIA Presl, 1849.

Genus dicatum in honorem Gustavi Lorinser . Presl. Epimel. Botanica 72.

Robust ferns. Rootstock long, creeping. Leaves of two kinds. Sori oblong, in rows parallel to the midribs of the pinnae.

1. L. areolata (L.) Presl. Pl. 5.

Lonchitis major Virginiana . . Morison, Hist. 3: 569. sect. 14. t. 2.
Acrostichum fronde pinnata . . Gron. Fl. 124.
A. areolatum L. Sp. Pl. 1069.
Woodwardia angustifolia J. E. Smith, l. c. 411. *Eaton*, Ferns 1: 165. t. 22. f. 2; in Gray Man. 683. *Clute*, Ferns 221. *Waters*, Ferns 124.
Lorinseria areolata Presl, l. c.
Woodwardia areolata Moore, 1857. Ind. Fil. 45. *Underw.* in Ill. Fl. 1: 20; Nat. Ferns 103; in Britt. Man. 10.

CHAIN FERN.

Plants 5–8 dm. high; sterile leaves deeply pinnatifid or nearly pinnate, lobes 5–8 cm. long, 1–2 cm. broad; fertile leaves taller, pinnate; pinnae linear, 5–10 cm. long.

In swamps or wet places. Summer.

14. ASPLENIUM Diosc.

The name "Asplenon" appears to have been applied by the ancients to Asplenium ceterach. The other species were known under various names, as Adiantum-nigrum, Lonchitis, Phyllitis, Ruta-muraria, Trichomanes &c.

Mostly rock-loving plants. Leaves various. Sori linear, situated along the free veinlet.

† *Leaves pinnatifid, sometimes pinnate.*

* *Lobes usually rounded.*

1. A. pinnatifidum Nutt. Pl. 3.

Asplenium pinnatifidum Nutt. 1818. Gen. 2: 251. *Eaton*, Ferns N. Am. 1: 61. t. 8. f. 2; in Gray Man. 683. *Underw.* in Ill. Fl. 1: 22; Nat. Ferns 103; in Britt. Man. 11. *Clute*, Ferns 167. *Waters* Ferns 130.

SPLEENWORT.

Low plants with the habit of *Camptosorus rhizophyllus*; leaves lanceolate, 6 cm. or longer, apex attenuate, lobes unequal, usually rounded; sori irregular.

In crevices of rocks. April-July.

Collected in several localities in Pennsylvania, West Virginia and Tennessee, but apparently rare in our region.

** *Lobes elongate.*

2. A. ebenoides Scott.

Asplenium ebenoides Scott; Berk. 1866. Journ. Hort. Soc. 87. t. 2. f. 1. *Eaton*, l. c. 1 : 25. t. 4. f. 2; in Gray l. c. 684. *Underw.* in Ill. Fl. 1 : 23; Nat. Ferns 103; in Britt. l. c. 11. *Clute*, l. c. 169. *Waters*, l. c. 133.

SPLEENWORT.

Plants 1–2 dm. high; leaves oblong-lanceolate, deeply pinnatifid or sometimes pinnate; lobes or pinnae unequal, 1–3 cm. long; apex of the leaf attenuate.

On limestone rocks, rare.

Botanists hold this species as a hybrid between *Asplenium platyneuron* and *Camptosorus rhizophyllus.*

†† *Leaves pinnate.*

* *Pinnae roundish-oval.*

3. A. trichomanes L. Pl. 2.

Asplenium trichomanes L. l. c. 1080. *Eaton*, l. c. 1 : 271. t. 36. ff. 1--3; in Gray l. c. 684. *Underw.* in Ill. Fl. 1 : 24; Nat. Ferns. 104; in Britt. l. c. 11. *Clute*, l. c. 155. *Waters*, l. c. 139.

MAIDENHAIR SPLEENWORT.

Plants 1–2 dm. high, growing in clusters; leaves linear; pinnae about 5 mm. long, entire or crenate; stipes dark-brown.

In rocky places. April–August.

** *Pinnae oblong, mostly opposite.*

4. A. resiliens Kunze.
Asplenium parvulum Mart. & Gal. 1842. Mem. Ac. Brux. 15 : 60. t. 15. f. 3. not Hooker. 1840. *Eaton*, l. c. 1 : 279. t. 36. ff. 5–6; in Gray l. c. 684. *Underw.* in Ill. Fl. 1 : 23; Nat. Ferns 104; in Britt. l.c. 11. *Clute*, l. c. 159.
Asplenium resiliens Kunze, 1844. Linnæa 18; 331. *Waters*, l. c. 159.

EBONY SPLEENWORT.

Plants 1–1.5 dm. high; leaves linear, rather rigid; pinnae numerous, subequal, obtuse, entire or nearly so, 0.5 cm. or longer, auricled on the upper side; stipes black, shining.

On limestone rocks.

*** *Pinnae oblong, mostly alternate.*

5. A. platyneuron (L.) Oakes. Pl. 4.
Trichomanes major foliis longis, auriculatis. Banist. Cat.; Ray, Hist. Pl. 2 : 1928.
Acrosticum platyneuron L. l. c. 1069.
Asplenium ebeneum Ait. 1789. Hort. Kew. 3 : 462. *Eaton*, l. c. 1 : 21. t. 4. f. 1; in Gray l. c. 684. *Clute*, l. c. 160. *Waters*, l. c. 144.
A. platyneuron Oakes; Eaton, l. c. 24. in note. *Underw.* in Ill.Fl. 1 : 23; Nat. Ferns 104; in Britt. l. c. 11.

EBONY SPLEENWORT.

Plants 2–5 dm. high; leaves linear, tapering towards the base; pinnae oblong, truncate at the base, sessile, auricled on the upper side, 1–3 cm. long, denticulate or sometimes incised.

In rocky places. April- September.

††† *Leaves pinnate to 3-pinnatifid.*

Leaves 2-pinnatifid below, pinnate above.

6, A. Bradleyi D. C. Eaton. Pl. 4.

Asplenium Bradleyi D. C. Eaton, 1873. Bul. Torr. Bot. Cl. 4 : 11; Ferns 2 : 39. t. 51. ff. 4–8; in Gray l. c. 684. *Underw.* in Ill. Fl. 1 : 26; Nat. Ferns 106; in Britt. l. c. 12. *Clute*, l. c. 166. *Waters*, l. c. 150.

SPLEENWORT.

Plants 1 dm. or higher; leaves linear-lanceolate; pinnae ovate-oblong, somewhat auricled, pinnatifid or simply dentate, 1 cm. or less in length; stipes brown.

In crevices of rocks.

7. A. montanum Willd.

Asplenium montanum Willd. 1810. Sp. Pl. 5 : 342. *Eaton*, l. c. 2 : 41. t. 51. ff. 9–11 : in Gray l. c. 684. *Underw.* in Ill. Fl. 1 : 25; Nat. Ferns. 106; in Britt. l. c. 12. *Clute*, l. c. 164. *Waters*, l. c. 154.

SPLEENWORT.

Plants 0.5–1 dm. high; leaves ovate-lanceolate, usually 2-pinnatifid; pinnae somewhat ovate-oblong, incised or pinnatifid, cuneate, the ultimate divisions variously toothed; stipes green except at the base.

In crevices of rocks.

††† *Leaves 2-pinnate to 3-pinnatifid below.*

8.A. ruta-muraria L   Pl. 4.

Asplenium ruta-muraria L. l. c. 1081. *Eaton*, l. c. 1: 107. t. 15. f. 1; in Gray l. c. 684. *Underw.* in Ill. Fl. 1: 25; Nat. Ferns 106; in Britt. l.c. 12. *Clute*, l. c. 162. *Waters*, l. c. 157.

WALL RUE.

Plants 1 dm. or higher; the ultimate divisions of the leaves rhombic, 6 mm. or less in length, apex toothed or incised; stipes green.

In crevices of rocks, or on old walls.

Asplenii species were used in Pre-Linnean times in the same way as *Adiantum Capillus-Veneris*. *Parkinson* [Theatr. Bot. 2: 1051. 1640.] says of [*Asplenium*] *Trichomanes*: "This Maidenhair in our Land being more plenfifull then the rest" . . "and both stayeth the shedding of the haire and causeth it to grow thick".

15. ATHYRIUM Roth, 1800.

Athyrium (a vocabulo αθυρος derivatum) Roth, Cat. Botanic. 2 : 143.

Robust ferns. Rootstocks creeping, usually covered by the persistent leaf-bases. Leaves pinnate to 3-pinnatifid. Sori more or less curved.

† *Leaves pinnate.*

1. A. pycnocarpon (Spreng.) Tm.

Lonchitis maxima foliis planis i. e. non dentatis &c. Banist.; Ray, Hist. 2 : 1927.

Asplenium angustifolium L. C. Rich.; Michx. Fl. 2 : 265, not Jacquin, 1786. *Eaton*, Ferns 2 : 73. t. 56. ff. 1–3; in Gray Man. 685. *Underw.* in Ill. Fl. 1 : 24; Nat. Ferns 105; in Britt. Man. 12. *Clute*, Ferns 187. *Waters*, Ferns 159.

A. pycnocarpon Spreng. 1804. Anleit. 3 : 112.

Athyrium pycnocarpon Tm. 1906. Elys. Mar. 36.

WOODFERN.

Plants 5–9 dm. high; pinnae on the sterile leaves stipitate, oblong-lanceolate, 2–9 cm. long, 0.5–1.5 cm. wide; fertile pinnae 1–6 cm. long, 6 mm. wide or less.

In rich woods; rather rare. Summer.

†† *Leaves 2-pinnatifid.*

2. A. thelypteroides (L. C. Rich.) Desv.

Asplenium acrostichoides Sw. Schrad. Jour. Bot. 1800 : 2 pt. 54. *Underw.* in Ill. Fl. 1 : 26; in Britt. l. c. 12.

A. thelypteroides

Asplenium thelypterioides L. C. Rich.; Michx. l. c. 265. *Eaton*, l. c. 2: 33. t. 50; in Gray l. c. 685. *Underw.* Nat. Ferns 107.

Athyrium thelypteroides Desv. Mem. Soc. Linn. Paris. 6: 2pt. 266. *Clute*, l. c. 185. *Waters*, l. c. 163.

SILVERY WOODFERN.

Plants 6–10 dm. high; leaves lanceolate; pinnae linear-lanceolate, acuminate, 7 cm. or less in length, 1 cm. wide; ultimate divisions oblong, obtuse, entire or obscurely dentate.

In moist woods. Summer.

††† *Leaves 2-pinnate to 3-pinnatifid.*

3. A. felix-foemina (L.) Roth.

Polypodium felix-foemina L. Sp. Pl. 1090.

Athyrium felix-foemina Roth, 1800, Tent. Flor. Germ. 3: 65. *Clute*, l. c. 179. *Waters* l. c. 167.

Asplenium felix-foemina Bernh. 1806. Schrad. Neues Journ. Bot. 1; 2pt. 26. *Eaton*, l. c. 2; 225. t. 76; in Gray Man. 685. *Underw.* in Ill. Fl. 1: 26; Nat. Ferns 107; in Britt. l. c. 12.

LADY FERN.

Plants 4–10 dm. high; leaves clustered at the apex of the stout rootstock; pinnae lanceolate, very variable, 4–7 cm. long, rather distant in typical specimens; pinnules oblong, variously toothed or incised, 1 cm. or less in length.

Mr. *W. Palmer* [Fern Bulletin 14: 78. 1906.] has recorded two forms of this species in Maryland and Virginia: *A. f. fœmina* [*typica*] and *A. f. fœmina rubellum.* The smaller green-stiped form agrees well with specimens collected near Stockholm, Sweden. In these the pinnules are normally oblong, obtuse and less than 1 cm. in length. In the larger or southern red-stemmed form there appears to be a greater variation—the pinnae being often crowded, with pinnules sometimes 2 cm. long and 6–8 mm. broad.

16. CAMPTOSORUS Link, 1833.

Rock-loving ferns growing in colonies. Leaves simple, rooting at the tips. Sori linear, scattered.

1. C. rhizophyllus (L.) Link. Pl. 2.

Phyllitis parva saxatilis per summitates folii prolifera. Banister; Ray. Hist. 2: 1927.
Asplenium rhizophyllum L. Sp. Pl. 1078.
Camptosorus rhizophyllus Link, Hort. Berol. 2: 69. *Eaton*, Ferns N. Am. 1: 55. t. 8. f. 1; in Gray Man. 685. *Underw.* in Ill. Fl. 1: 21; Nat. Ferns 108; in Britt. Man. 13. *Clute*, Ferns 265. *Waters*, Ferns 179.

WALKING FERN.

Low plants; leaves in a cluster from the short rootstock, cordate, auricled or halberd-shaped and gradually narrowed into a point, which is sometimes 1.5 dm. long and 1 mm. or wider. The entire leaf is sometimes 2.5 dm. long.

On shaded limestone rocks.

17. POLYSTICHUM Roth, 1800.

Hoc genus Polystichum nominavi (ex verbis πολυ *multum et* στιχος *ordo) quia fructificationum puncta plura in ordines vel series ordinata plerumque observantur. Roth*, Fl. Germ. 3:69.

Rootstock stout, very chaffy. Leaves pinnate, spinulose-serrate. Sori large. Indusium peltate.

1. **P. acrostichoides** (L. C. Rich.) Schott.

Filix mas foliis integris auriculatis Banister; Ray, Hist. 1926.

Polypodium fronde pinnata lanceolata, foliis lunulatis ciliato-serratis. Gron. Fl. Virg. 123.

Nephrodium acrostichoides L. C. Rich.; Michx. 2: 267.

Aspidium acrostichoides Sw. Syn. Fil. 44. *Eaton*, Ferns N. Am. 1: 257. t. 34; in Gray Man. 689.

Polystichum acrostichoides Schott, 1834. Gen. Fil. *Underw.* Nat. Ferns 115; in Britt. Man. 14. *Clute* Ferns 106. *Waters*, Ferns 244.

Dryopteris acrostichoides Kuntze, 1891. Revisio Gen. 2: 812. *Underw.* in Ill. Fl. 1: 14.

CHRISTMAS FERN.

Plant 3—6 dm. high; leaves very chaffy below; pinnae 2—8 cm. long, auricled on the upper side, oblong-lanceolate, spinulose-dentate; upper pinnae fertile, reduced and at length covered by the numerous sori.

In dry, deciduous woods.

The form *P. acr. Schweinitzii*, having toothed or incised pinnae, has been observed by *J. H. Painter* at Cabin John, Md.

18. DRYOPTERIS Adanson, 1763.

Rootstock creeping or stout, ascending. Leaves 2–3-pinnatifid. Sori orbicular. Indusium reniform or orbicular, fixed by its sinus.

† *Leaves 2-pinnatifid, pinnae linear-lanceolate.*

* *Pinnae 1 cm. more or less wide, sessile, tapering both ways.*

1. D. noveboracensis (L.) A. Gray.

Polypodium noveboracense L. Sp. Pl. 1091,
Aspidium noveboracense Sw. Schrad. Journ. Bot. 1800: pt. 2. 38. *Eaton*, Ferns N. Am. 1: 49. t. 7; in Gray, Man. 687. *Clute*, Ferns 120.
Nephrodium noveboracense Desv. 1827. Mem. Soc. Linn. Paris. 6: 2 pt. 257. *Waters*, Ferns 209.
Dryopteris noveboracensis A. Gray, 1848. Man. 630. *Underw.* in Ill. Fl. 1: 15; Nat. Ferns 111; in Britt. Man. 15.

NEW YORK FERN.

Plants 5dm. or higher; leaves lanceolate; pinnae 7 cm. or less in length, deeply pinnatifid; ultimate segments oblong, obtuse; sori small.

In moist, deciduous woods. Summer.

** *Pinnae 1 cm. more or less wide, sessile tapering towards the apex of the leaf.*

2. D. simulata Davenp.

Aspidium simulatum Davenp. 1894. Bot. Gaz. 19: 497. *Clute*, l. c. 123.
Dryopteris simulata Davenp. l. c. as syn. *Under.* in Ill. Fl. 1: 16; Nat. Ferns 111; in Britt. Man. 15.
Nephrodium simulatum Davenp. l. c. as synon. *Waters*, l. c. 205.

MASSACHUSETTS FERN.

Plants 6 dm. or higher; leaves oblong-lanceolate; pinnae 7 cm. or less in length, acuminate, deeply pinnatifid; ultimate segments oblong, obtuse; sori small.

In low, moist woods.

Glen Burnie, Md., *W. Maxon.*

*** *Lower pinnae stalked, 1–2 cm. wide.*

3. D. thelypteris (L.) A. Gray.

Filix pumila palustris Virginiana . . Pluken. Alm. 151. Phyt. t. 284. f. 1.
Acrostichum thelypteris L. l. c. 1071.
Aspidium thelypteris Sw. l. c. 40. *Eaton*, l. c. 1: 233. t. 30; in Gray, l. c. 686. *Clute*, l. c. 112.
Nephrodium thelypteris Desv. l. c. 257. *Waters*, l. c. 199.
Dryopteris thelypteris A. Gray, 1848. Man. 630. *Underw.* in Ill. Fl. 1: 15; Nat. Fern. 111; in Britt. l. c. 14.

MARSH FERN.

Plants 3–6 dm. high; leaves lanceolate; pinnae linear-lanceolate, 4–10 cm. long, deeply pinnatifid, ultimate segments rounded, nearly entire; sori small, crowded.

In wet or marshy ground. June–August.

†† *Leaves 2-pinnatifid; pinnae linear-lanceolate to ovate, widest near the middle.*

4. D. Goldiana (Hook.) A. Gray.

Aspidium Goldianum Hook. 1822. Edinb. Philos. Journ. 6: 333. *Eaton*, l. c. 1: 305. t. 40; in Gray, l. c. 688. *Clute*, l. c. 137.

Dryopteris Goldiana A. Gray, 1848. Man. 630. *Under.* in Ill. Fl. 1: 17; Nat. Ferns 113; in Britt. Man. 15.

Nephrodium Goldianum Hook. & Grev. Icon. Fil. t. 102. *Waters*, l. c. 230.

GOLDIE'S FENR.

Plants 6–15 dm. high; leaves ovate-lanceolate, sometimes neary 2-pinnate below; pinnae sometimes 1.5 dm. long, deeply pinnatifid, ultimate segments oblong, acute, crenate-dentate; sori small.

In moist woods; rare.

Baltimore Co., Md., *Waters*; Washington, *Ward*, *Vasey*; White Top Mt., Va., *Small*.

D. Goldiana celsa W. Palmer, 1899. Proc. Biol. Soc. Wash. 13: 65. t. 1. ff. 1–6, 8–18, differs from the species by its narrower pinnae.

Dismal Swamp Region, Va. *W. Palmer*.

††† *Leaves 2-pinnatifid; pinnae linear, ovate or lanceolate, widest at the base.*

* *Pinnae obtuse or acute.*

5. **D. cristata** (L.) A. Gray. Pl. 6.
Polypodium cristatum L. Sp. Pl. 1090.
Aspidium cristatum Sw. l. c. 37. *Eaton*, l. c. 2: 153. t. 66; in Gray, l. c. 688. *Clute*, l. c. 139.
Nephrodium cristatum L. C. Rich.; Michx. Fl. 2: 269. *Waters*, l. c. 225.
Dryopteris cristata A. Gray, 1848. Man. 631. *Under.* in Ill. Fl. 1: 16; Nat. Ferns 113; in Britt. Man. 15.

CRESTED FERN.

Plants 6 dm. or higher; leaves linear or linear-lanceolate; pinnae subequal, ovate-oblong to triangular-ovate, 5 cm. or longer, obtuse or acute; lobes rounded, serrate; sori few or as many as 6 to each lobe.

In moist woods.

I have never seen the typical *D. cristata* in our region. Specimens from Maryland and Virginia approach more nearly *Aspidium lancastriense Spreng.* (Anleit. 3: 134. 1804. –**D. cristata lancastriensis.**) This form differs from the European type by its longer and more slender upper pinnae. An extreme form with linear leaves and obtuse pinnae (**D. cristata mariana**) is found occasionally. Intermediate forms abound in any *D. cristata* colony.

** *Pinnae acuminate.*

6. **D. Clintoniana** (D. C. Eaton) Dowell. Pl. 6.
Aspidium cristatum Clintonianum D. C. Eaton, 1867. in Gray, Man. ed. 5. 665.
Dryopteris cristata Clintoniana Underw. 1893. Nat. Ferns ed. 4. 115.
D. Clintoniana Dowell, 1906. Proc. S. I. Assoc. Sc. 1 : 64.

CLINTON'S FERN.

Plants 6–12 dm. high; pinnae ovate-lanceolate, deeply pinnatifid, 8–15 cm. long, sessile or stalked, spreading; lobes usually distant, oblong, cut-lobed or serrate; sori borne on the free veinlets near the midvein of the lobes.

In moist woods.

Fairfax Co. Va. *W. Palmer.*

†††† *Leaves 2-pinnate to 3-pinnatifid.*

* *Pinnules entire or crenate.*

7. **D. marginalis** (L.) A. Gray.
Polypodium marginale L. l. c. 1091.
Nephrodium marginale L. C. Rich.; Michx. Fl. 2 : 267. *Waters*, l. c. 236.
Aspidium marginale Sw. Syn. Fil. 50. *Eaton*, l. c. 2 : 69. t. 55; in Gray, Man. ed. 6. 688. *Clute*, l. c. 134.
Dryopteris marginalis A. Gray, 1848. Man. 632. *Underw.* in Ill. Fl. 1 : 17; Nat. Ferns 113; in Britt. Man. 15.

WOOD FERN.

D. marginalis

Plants 2–5 dm. or higher; leaves oblong-lanceolate, glaucous beneath; pinnae rather distant, subopposite, 12 cm. or less in length, 3 cm. or less in width; pinnules short-stalked or sessile, oblong, acute or obtuse, pinnatifid or nearly entire; sori marginal.

In rocky woods. Summer.

** *Pinnules spinulose-dentate.*

8. **D. Boottii** (Tuckerm.) Underw.

Aspidium Boottii Tuckerm. 1843. Hovey's Mag. 9: 145. *Eaton*, l. c. 2: 175. t. 69; in Gray, Man. 687. *Clute*, l. c. 141.

Dryopteris Boottii Underw. 1893. Nat. Ferns ed. 4. 117; ed. 6. 114; in Ill. Fl. 1: 18; in Britt. l. c. 16.

Nephrodium Boottii Waters, l. c. 221.

BOOTT'S FERN.

Plants 3–8 dm. high; leaves linear-lanceolate; lowest pair of pinnae triangular-ovate, 6 cm. more or less long, 2 cm. or less wide at the base; the upper pinnae narrower, 7 cm. or less long, acuminate; pinnules, except the basal pair of the lower pinnae, spinulose-dentate; the latter pinnules are somewhat pinnatifid; sori small.

In moist woods.

Fairfax Co. Va. *W. Palmer.*

††††† *Leaves 3-pinnafid to 3-pinnate.*

* *Lower pinnae broadly tri-angular.*

9. **D. spinulosa** (Retz.) Kuntze. Pl. 7.

Polypodium spinulosum Retz. 1795. Fl. Scand. ed. 2. 250.

Aspidium spinulosum Sw. Schrad. Journal Bot. 1800: pt. 2. 38. *Eaton*, l. c. 2: 163; in Gray, l. c. 687. *Clute*, l. c.

Nephrodium spinulosum Desv.; Hook. 1861. Br. Ferns t. 18. *Waters*, l. c. 214.

Dryopteris spinulosa Kuntze, 1891. Revis. Gen. 2: 813. *Underw.* in Ill. Fl. 1: 18; Nat. Ferns 114; in Britt. l. c. 16.

WOOD FERN.

Plants 5 dm. more or less in heigth; leaves ovate-lanceolate; lower pinnae 6 cm. or less in length, the basal pinnules exceeding the others in length; upper pinnae elongate-triangular to oblong, acuminate; pinnules oblong, acute, decurrent, pinnatifid; lobes spinulose-dentate; sori small, usually on to each lobe.

In moist woods.

** *Lower pinnae triangular-ovate.*

D. spinulosa intermedia (Muhl.) Underw. Pl. 7.

Polypodium intermedium Muhl.; Willd. 1810. Sp. Pl. 5: 262.

This form differs from the type by its larger and more spreading pinnae. The basal pinnules of the lower pinnae are usually equal to or shorter than the adjacent pair.

** *Lower pinnae unequally triangular-ovate.*

D. spinulosa dilatata (Hoffm.) Underw.

Polypodium dilatatum Hoffm. 1796. Deutsch. Fl. 2 : 7.

Plants 6 dm. more or less in heigth; leaves usually 3-pinnate below, oblong-ovate; pinnae (except the lowest pair) oblong-lanceolate, 15 cm. or less in length; pinnules oblong, pinnatifid or pinnate, the inferior ones of the lowest pair of pinnae much elongated; ultimate segments spinulose-dentate or incised.

White Top Mt., Va., *Small.*

19. FILIX Adanson, 1763.

This name is the classic name for fern. Adanson based his genus on Filix baccifera Corn. canadens. 5. (Polypodium bulbiferum L.)

Somewhat delicate ferns. Rootstock short and stout or long, creeping. Leaves variable, usually 2–3-pinnate, thin, membranous. Sori small, situated at about the middle of the veinlets. Indusia delicate.

† *Leaves bulbiferous, apex attenuate.*

1. F. bulbifera (L.) Underw.

Polypodium bulbiferum L. Sp. Pl. 1091.

Cystopteris bulbifera Bernh. 1806. Schrad. Neu. Journ. Bot. 1 : 2 pt. 26. *Eaton*, Ferns N. Am. 2 : 55. t. 53. ff. 13–17; in Gray, Mau. 689. *Uuder.* in Ill. Fl. 1 : 12. *Clute*, Ferns 212. *Waters*, Ferns 255.

Filix bulbifera Underw. 1900. Nat. Ferns 119; in Britt. Man. 17.

BULBIFEROUS FERN.

Plants 3–6 dm. or higher; leaves 3-pinnatifid below; pinnae lanceolate, sessile, 6 cm. or less in length, pinnules oblong-lanceolate, 2 cm. or less in length, decurrent on the rachilla, lobes toothed. Easily recognized by its attenuate apex and bulbils, 3–4 mm. in diameter

In shaded, rocky places. Summer.

Fairfax Co., Va., *Maxon*, *W. Palmer*; Harper's Ferry, *Henshaw*; Natural Bridge, *Everman*; Marion, *Miss Vail*, *Small.*

"In America Septentrionali passim inter saxa prouenit, baccae media aestate maturescunt, folia Nouembri marescunt, superstite sola per hyemem radice." . . *Cornut*, Can. Pl. Hist. 5. 1635.

†† *Leaves with an acute apex.*

2. F. fragilis (L.) Underw.

Polypodium fragile L. l. c.
Cystopteris fragilis Bernh. l. c. *Eaton*, l. c. 2: 49. t. 53. ff. 1–8; in Gray, Man. 689. *Underw.* in Ill. Fl. 1: 13. *Clute*, l. c. 209. *Waters*, l. c. 259.
Filix fragilis Underw. Nat. Ferns 119; in Britt. Man. 17.

BRITTLE FERN.

Plants sometimes 4 dm. high, but usually smaller; leaves lanceolate, 3-pinnatifid; pinnae ovate-lanceolate, 4 cm. or less in length; pinnules ovate, decurrent on the rachilla, lobes entire or toothed.

In rocky places. Summer.

20. WOODSIA, R. Brown, 1810.

This genus I have named in honor of my friend Mr. Joseph Woods . . R. Brown, Trans. Linn. Soc. 11: 171.

Rootstock short, ascending. Leaves 2-pinnatifid to 2-pinnate. Sori situated near the end of the veinlets. Indusium globular, at length splitting into numerous lobes.

† *Leaves 2-pinnatifid, pinnae somewhat crowded.*

1. W. ilvensis (L.) R. Brown.

Acrostichum ilvense L. Sp. Pl. 1071.

Woodsia ilvensis R. Brown, l. c. 173. *Eaton*, Ferns 2: 111. t. 60. ff. 5–8; in Gray, Man. 690. *Underw.* in Ill. Fl. 1: 10; Nat. Ferns 121; in Britt. Man. 18. *Clute*, Ferns 93. *Waters*, Ferns 273.

RUSTY WOODSIA.

Plants 1–2 dm. high, growing in clusters; leaves linear-lanceolate; pinnae deeply pinnatifid, ovate-oblong, 1 cm. or less in length, sessile, more or less covered with a brownish chaff, lobes rounded; sori confluent, at length covering more or less the lower face of the leaf.

In crevices of rocks.

Stony Man Mt., Va., *Steele*, *W. Palmer*, *King*.

†† *Leaves 3-pinnatifid, pinnae rather distant,*

2. W. obtusa (Spreng.) Torr. Pl. 5.

Polypodium obtusum Spreng. 1804. Anl. 3: 92.

W. obtusa.

Woodsia obtusa Torr. 1840. Geol. Report N. Y; Fl. N. Y. 2: 500. *Eaton*, l. c. 2: 189. t. 71. ff. 5–8; in Gray, Man. 691. *Underw.* in Ill. Fl. 1: 11; Nat. Ferns 122; in Britt. Man. 18. *Clute*, l. c. 96. *Waters*, l. c. 280.

WOODSIA.

Plants 2–4 dm. high; leaves linear-lanceolate; pinnae tapering both ways, 4 cm. or less in length, ovate-oblong, pinnules oblong, obtuse, 1 cm. or less in length, lobes rounded, variously toothed; sori at length confluent.

In rocky woods.

21. DENNSTÆDTIA Bernh. 1801.

In memoriam Dennstaedtii, autoris Florae Vinariensis, generi nomen attribui. Bernh. Schrad. Journ. Bot. 1800: 2 pt. 124.

Rootstock slender, creeping. Leaves of delicate texture. Sori small, marginal, at the end of the free veinlets. Indusium cup-shaped.

1. D. punctilobula (L. C. Rich.) Moore. Pl. 7.

Nephrodium punctilobulum L. C. Rich.; Michx. Fl. 2: 268.

Dicksonia pilosiuscula Willd. 1809. Enum. 1076. *Eaton*, Ferns 1: 339. t. 44; in Gray, Man. 691. *Clute*, Ferns 229. *Waters*, Ferns 286.

Dicksonia punctilobula Hook. 1846. Sp. Filic. 1: 79. *Underw.* in Ill. Fl. 1: 12.

D. punctilobula.

Dennstaedtia punctilobula Moore, 1857. Ind. Fil. 97. *Underw.* Nat. Ferns 122; in Britt. Man. 19.

BOULDER FERN.

Plants 6 dm. or higher; leaves oblong-lanceolate, 3-pinnatifid; pinnae rather distant, 11 cm. or less in length, 4 cm. or less in width, oblong-lanceolate; pinnules oblong, decurrent on the rachilla, deeply pinnatifid; lobes variously toothed or cleft; stipes red-brown; rachis and lower face pubescent; sori borne on deflexed teeth, one at the upper margin of each lobe

In rocky woods. Summer.

22. MATTEUCCIA Todaro, 1866.

Named in honor of Carlo Matteucci, an Italian physicist.

Robust plants with creeping rootstock. Leaves in a crown, forming handsome clusters. Fertile leaves reduced, pinnate, the contracted pod-like divisions enclosing the sporangia.

1. M. struthiopteris (L.) Todaro.

Osmunda struthiopteris L. Sp. Pl. 1066.

Onoclea struthiopteris Hoffm. 1795. Deutsch. Fl. 2: 11. *Eaton*, Ferns 2: 201. t. 73; in Gray, Man. 690. *Underw.* in Ill. Fl. 1: 9.

Struthiopteris germanica Willd. 1809. Enumer. 1071. *Clute*, Ferns 257. *Waters*, Ferns 269.

Matteuccia struthiopteris Todaro, Syn. Fil. Sic. *Underw.* Nat. Ferns 120; in Britt. Man. 19.

OSTRICH FERN.

Plants 6 dm. or higher; sterile leaves broadly lanceolate, narrowed towards the base; pinnae linear, acuminate, 12 cm. more or less in length, 1.5 cm. or less wide, deeply pinnatifid, lobes oblong, rounded; fertile leaves much shorter, pinnate.

Along riverbanks. Summer.

Gunpowder River, Md., *Waters*; Plummer's Island, *Steele*; Fairfax Co., Va., *Maxon*.

23. ONOCLEA L. 1753.

Robust plants with creeping rootstocks. Leaves scattered. Fertile leaves 2-pinnate, the contracted pod-like divisions enclosing the sporangia.

1. O. sensibilis L.

Filix Osmunda facie Mariana . . . *Pluk.* 1700. Mant. 80. t. 404. f. 2.

Osmunda frondibus pinnatis: foliis superioribus basi connatis . . *Gron.* 1743. Fl. 2: 196.

Onoclea sensibilis L. Sp. Pl. 1062. *Eaton*, Ferns 2: 195. t. 72; in Gray, Man. 690. *Underw.* in Ill. Fl. 1: 9. Nat. Ferns 120; in Britt. Man. 19. *Clute*, Ferns 253. *Waters*, Ferns 265.

SENSITIVE FERN.

Plants 3–6 dm. high; sterile leaves long-stalked triangular-ovate, 2-pinnatifid below; pinnae 15 cm. or less in length, 4 cm. or less wide, pinnatifid or sinuately lobed; fertile leaves much reduced, 4 cm. or less high.

Frequent in moist places. Summer.

24. MARSILIA L. 1737.

This name was dedicated by Michelius [Nov. Gen. 5. 1729.] *to Aloysius Marsilius, an Italian physicist. It was then applied to species which Linnaeus afterwards included in his genus Jungermannia. The present genus Marsilia was known to the Pre-Linnean botanists by the names Lenticula, Lens palustris &c., names which were also applied to our present Lemna species.*

Plants with slender, creeping rootstock. Leaves long-petioled. Sporocarps borne on short peduncles, arising from the rootstock and being more or less adnate to the petiole.

1. M. quadrifolia L. Pl. 2.

Marsilia quadrifolia L. Sp. Pl. 1099. *Eaton*, in Gray, Man. 701. *Underw.* in Ill. Fl. 1: 33; Nat. Ferns 123; in Britt. Man. 20. *Clute*, 1905. Fern Allies 195.

Submerged plants; leaves bearing a whorl of four obovate-cuneate, 1.5 cm. long leaflets; sporocarps ovoid.

Introduced into the fishponds at Washington, D. C. where it grows in great profusion.

Pre-Linnean authors seem to agree that this is the plant mentioned by Theophrastus under the name **Lemma.** Dalechamp [Hist. Plant. 1: 1014. 1587.] described and figured it under that name.

The following description is taken from Parkinson [Theatrum Botanicum 2: 1262. 1640.] to illustrate the language and the method of those days.

2. Lens palustris sive aquatica quadrifolia.

Crosse-leafed Water Lentils or Duckes meate.

This other Lens hath a small long slender roote shooting forth square slender weake and trailing stalkes, with sundry small leaves upon severall long foot stalkes, standing together at the joynts distinct one from an other, which are parted into four leaves a peece and sometimes it has beene observed with six leaves, each end being round and lying in a square forme like a crosse upon the water: at the joynts likewise with the leaves, come forth diverse small heads of seede like unto the fielde Lentils, but not so flat, being thicke and hard. *Lugdunensis* setteth forth this kind of water plant, by the name of *Lemma Theophrasti.* in a much different manner."

25. ISOETES L. 1751.

The name is derived from έτος, *annus*, ἰσος, *similis according to Linnæus* [Phil. Bot.] *who also states* [Iter. scan.] *that the name is old and was formerly applied to Sedum.* [Plini Hist.]

Mostly small, aquatic, amphibious or terrestrial plants. Stem a fleshy, depressed corm. Leaves awl-shaped or linear, dilated at the base. Sporangia orbicular or ovoid sessile in the axils of the leaves. Spores of two kinds.

† *Leaves 5–13 cm. long.*

1. I. saccharata Engelm. Pl. 9.

Isoetes saccharata Engelm. 1867. in Gray, Man. 676, ed. 6. 699. *Underw.* in Ill. Fl. 1 : 47; Nat. Ferns 145; in Britt. Man. 28. *Clute*, Fern Allies 240.

Isoetes saccharata.

Plants growing in colonies; leaves linear, olive-green in color, 5–13 cm. long, 10--20 in a cluster; sporangia oblong, 5 mm. or less in length.

Along riverbanks between tidal limits.

In various localities along Chesapeake Bay from Wicomico River northward: along Potomac River, Eastern Branch, Fourmile Run, *Steele*; Hunting Creek, *Vasey*, *Coville;* Notley Hall, Mt. Vernon, *Coville.*

The geographical distribution of this species and its forms has been discussed at length by *G. H. Shull* [Bot. Gaz. 36: 187. 1903.].

†† *Leaves 20 cm. or longer.*

2. I. valida (Engelm.) Clute.

Isoetes Engelmanni valida Engelm. in Gray, Man. 677; ed. 6. 700. *Underw.* in Ill. Fl. 1: 48; Nat. Ferns 147; in Britt. Man. 29.

I. valida Clute, Fern Allies 236.

Plants sometimes 4 cm. thick at the base; leaves 50 to 200 in number, sometimes 6 dm. long; sporangia oblong, 1–2 cm. long.

In pools and ditches. Summer.

Near Great Falls, Potomac River, *Ward*; Salt Pond Mt., Va., *Canby.*

26. EQUISETUM Plinius.

Equisetum, hippuris Græcis dicta et in pratis vituperata nobis –est autem pilus terræ equinæ saetæ similis. Plinius, Hist. Nat. XXVI, 132.

Mostly robust plants. Rootstock creeping, mostly perennial. Stem erect, grooved, branchless in some species, or with simple or compound, verticillate branches in others. Leaves rudimentary, verticillate, united nearly their entire length, forming sheaths at the nodes of the stem.

† *Stems of one kind.*

* *Ridges of the stem with one line of tubercles.*

1. E. praealtum Rafin. Pl. 8.

Equisetum praealtum Rafin. 1817. Fl. Lud. 13.
E. robustum A. Br. 1843. Amer. Journ. Sc. 46: 88 [transl. by Dr. Engelmann]. *Eaton*, in Gray, Man. 677. *Underw.* in Ill. Fl. 1 : 38; Nat. Ferns 129; in Britt. Man. 23. *Clute*, Fern Allies 26.

SCOURING RUSH.

Plants sometimes 2 m. or more in height; stems 1 cm. or wider at the base and usually simple; sheaths short, appressed, marked with two black girdles; teeth caducous; spikes ovate, 1 cm. or longer, mucronate.

Along riverbanks and creeks.

** *Ridges of the stem with two lines of tubercles.*

2. E. hyemale L. Pl. 8.

Equisetum hyemale L. Sp. Pl. 1062. *Eaton*, l. c. 677. *Underw.* in Ill. Fl. 1 : 38; Nat. Ferns 129; in Britt. Man. 23. *Clute*, l. c. 19.

SCOURING RUSH.

Equisetum hyemale.

Plants 1 m. more or less in height; stems 5 mm. or wider at the base; sheaths about 1 cm long, somewhat spreading, marked with one or two narrow girdles; teeth acuminate, caducous; spikes somewhat conical, mucronate.

Along riverbanks and creeks.

†† *Stems of two kinds.*

* *Branches simple.*

3. E. arvense L. Pl. 8.

Equisetum arvense &c. Gron. Fl. Virg. 123.
E. arvense L. Sp. Pl. 1061. *Eaton*, l. c. 676. *Underw.* in Ill. Fl. 1 : 36; Nat. Ferns 127; in Britt. Man. 22. *Clute*, l. c. 43.

HORSETAIL.

Plants 3–6 dm. or higher; sterile stems bearing numerous linear branches of variable lengths; sheaths about 1 cm. long including the darkbrown, acuminate teeth; fertile stems (appearing in early spring) about 2 dm. in heigth, branchless; spikes oblong, 3 cm. or shorter.

Along railroad embankments, in fields and low ground.

** *Branches compound.*

E. sylvaticum L. Pl. 8.

Equisetum sylvaticum L. l. c. *Eaton*, l. c. *Und.* in Ill. Fl. 1 : 36; Nat. Ferns 127; in Britt. Man. 22. *Clute*, l. c. 55.

HORSETAIL.

Plants 4 dm. or higher; branches linear, developing after fructification; branchlets reflexed; sheaths loose, spreading, about 2 cm. long including the free, brownish, blunt teeth; spikes oblong, acute, 1–3 cm. long.

Reported from this region, but I have never seen it in localities south of New York. *Mr. J. H. Painter* has collected it in Chester Co., Pa.

27. LYCOPODIUM Dodon. 1567.

Muscum terrestrem non pauci hac aetate appellant: Germani Beerlap, Gurtelkraut, Seilkraut, Haarshar, Teuffels Klauwen: Belgae Wolfsclauwen appellant: unde Lycopodium & Pes lupi a nobis dici coepit. Dodon. 1583. Stirp. Hist. 470.

Mosslike perennials with creeping or erect stems of variable lengths. Leaves small, simple, imbricated or 4–many-ranked. Sporangia borne in the axils of the leaves.

† *Leaves of one kind.*

* *Sporangia borne in the axils of ordinary leaves.*

§ *Leaves ascending or appressed.*

1. L. selago L.

Lycopodium selago L. Sp. Pl. 1102. *Eaton*, in Gray, Man. 695. *Underw.* in Ill. Fl. 1: 40; Nat. Ferns 130; in Britt. Man. 24. *Clute*, Fern Allies 112.

Lycopodium selago.

Plants 6–15 cm. high, growing in colonies; stems numerous, erect, dichotomous; leaves lanceolate-acuminate.

On rocks. Autumn.

Stony Man Mt., Va., *Steele.*

§§ *Leaves usually spreading or reflexed.*

2. L. lucidulum L. C. Rich. Pl. 9.

Lycopodium lucidulum L. C. Rich.; Michx. Fl. 2: 284. *Eaton*, in Gray, Man. 696. *Underw.* in Ill. Fl. 1: 40; Nat. Ferns 131; in Britt. Man. 24. *Clute*, Fern Allies 107.

Plants 1–3 dm. high, with ascending, forking stems; leaves darkgreen, shining, 0.5–1.5 cm. long, oblong-lanceolate, minutely toothed, arranged in bands of alternately long and short ones.

In damp woods. Autumn.

Baltimore Co., Md., *Steitz*, *Waters*; Spencerville, *Holzinger*; Woodside, *Pollard*; Sligo, *Steele*; Riverdale, *Ward*; Rock Creek Park D. C., Fairfax Co., Va. *Maxon*; Snicker's Gap, Stony Man Mt., *Palmer*.

** *Sporangia borne in terminal spikes.*

§ *Leaves sparingly toothed.*

3. L. Chapmani Underw. Pl. 9.

L. inundatum appressum Chapm. 1878. Bot. Gaz. 3: 20, not *L. selago appressum Desv.* 1827.

Lycopodium Chapmani.

L. adpressum Lloyd & Underw. 1900. Bull. Torr. Bot. Cl. 27: 153. *Underw.* Nat. Ferns 132.

L. Chapmani Underw.; Maxon, Proc. U. S. Nat. Mus. 23: 646; in Britt. Man. 1037.

L. alopecuroides adpressum Clute, Fern All. 118.

Plants with prostrate stems, rooting at intervals; leaves lanceolate, acuminate, 5–6 mm. long; fertile stems leafy, 10–15 cm. or longer, 3–4 mm. thick; spikes narrow, 2–4 cm. long, 4 mm. thick.

In wet, springy clay soil. Summer.

§§ *Leaves bristle-toothed below the middle.*

4. L. alopecuroides L.

Mucsus terrestris repens Virginianus, humi diffusus &c. Moris. Pl. Hist. 3: 624. sect. 15. t. 5. f. 12.

Lycopodium ramis reflexis . . . Gron. Fl. 126.

L. alopecuroides L. Sp. Pl. 1002. *Eaton*, in Gray Man. 699. *Underw.* in Ill. Fl. 1: 41; Nat. Ferns 133; in Britt. Man. 25. *Clute*, l. c. 116.

Robust plants sometimes 5 dm. high, with long creeping or ascending branches; leaves spreading, 1 cm. or shorter, linear, spinulose; spikes about 4 cm. long.

In swamps.

I have seen no specimens from our region, but many from New Jersey, Delaware, Eastern North Carolina and southwards. It occurs without much doubt in the intervening region —the Eastern Shore of Maryland.

†† *Leaves of two kinds, those of the spike scale-like.*

* *Spikes sessile.*

5. L. obscurum L. Pl. 9.

Lycopodium obscurum L. Sp. Pl. 1102. *Eaton*, in Gray Man. 696. *Underw.* in Ill. Fl 1: 41; Nat. Ferns 133; in Britt. Man. 25. *Clute*, Fern All. 99.

Plants 2--3 dm. high, with creeping rootstocks; stems erect, forking; branches spreading; leaves linear, 6–8-ranked, incurved or appressed, very numerous, 3–4 mm. long; spikes several, 3 cm. or longer, about 5 mm. thick, the scale-like leaves ovate-acuminate, scarious.

In damp woods. August.

** *Spikes apparently peduncuIate.*

§ *Leaves uniform.*

6. L. clavatum L.

Lycopodium clavatum L. Sp. Pl. 1001. *Eaton*, l. c. 697. *Underw.* in Ill. Fl. 1: 43; Nat. Ferns 134; in Britt. Man. 25. *Clute*, l. c. 81.

Plants with long, creeping stems; branches ascending, forking, very leafy; leaves many-ranked, linear, bristle-tipped, 5 mm. or longer, incurved or spreading; fertile stems 1 mm. or thicker, 1 dm. or longer including the narrow spikes; the latter 2 or more, about 3 cm. long, 4 mm. or less thick.

In woods. Autumn.

Sandy Springs, Md., *Palmer*; Lanham, *Wheeler*.

§§ *Leaves not uniform.*

1 Fertile stems uni-spicate

7. L. carolinianum L.

Lycopodium carolinianum L. Sp. Pl. 1104. *Eat.* l. c. 697. *Underw.* in Ill. Fl. 1 : 43 ; Nat. Ferns 133 ; in Britt. Man. 26. *Clute*, l. c. 120.

Plants with creeping, flattened stems and short, sterile branches ; leaves lanceolate, sessile, 5 mm. long ; fertile stems 2 dm. or higher, beset with few linear leaves ; spikes 2–5 cm. long.

In moist pine woods.

Near Branchville, Md., *Maxon.*

2 Fertile stems 2–3-spicate.

a Leaves 4-ranked, those of the lower side much reduced.

8. L. complanatum L. Pl. 9.

Lycopodium complanatum L. l. c. 1104. *Eaton*, l. c. 697. *Underw.* in Ill. Fl. 1 : 43 ; Nat. Ferns 135 ; in Britt. Man. 26. *Clute*, l. c. 88.

Plants with long, creeping rootstocks and spreading fan-shaped branches ; leaves minute, cuspidate, those of the lower side scarcely more than 0.5 mm. long ; fertile stems (with few awl-shaped leaves) forking above and bearing two or more narrow spikes.

In woods. Autumn.

b Leaves 4-ranked, nearly uniform.

9. L. tristachyum Pursh.

Lycopodium tristachyum Pursh, 1814. Fl. 2 : 653. *Underw.* in Britt. Man. 1037.
L. chamaecyparissus A. Braun, 1843. in Doell, Rhein. Fl. 36. *Underw.* Nat. Ferns 136.
L. complanat. chamaecyparissus Eaton, in Gray Man. 697. *Underw.* in Ill. Fl. 1 : 43.

Plants similar to the preceding species from which it differs by its narrower branches and its nearly uniform leaves. The rootstocks of this species are 2 dm or longer and are found at a depth of 2 cm. or more.

In woods. "On high mountains in Virginia, near Sweet Springs" Pursh l. c.

I have observed this species on dry slopes in the region occupied by *Pinus virginiana.* It is abundant on the mountain side at Clifton Forge, Va., with *P. pungens.*

28. SELAGINELLA Beauv. 1805.

Small moss-like plants with numerous, branching stems. Leaves mostly minute, scale-like, 4–many-ranked. Sporangia axillary.

† *Leaves appressed.*

1. S. rupestris (L.) Spring.

Muscus terrestris repens Virginianus &c. Moris. Hist. 624. sect. 15. t. 5. f. 4.
Lycopodium rupestre L. Sp. Pl. 1101.

Selaginella rupestris.

Selaginella rupestris Spring, 1840. in Fl. Brasil. 1: pt. 2. 118. *Eaton*, l. c. 698. *Underw.* in Ill. Fl. 1: 44; Nat. Ferns 137; in Britt. Man. 26. *Clute*, l. c. 139.

Plants 3–10 cm. high, growing in colonies; stems slender, 1 mm. or thicker, with numerous short, very leafy branches; leaves imbricated, many-ranked, awl-shaped, awned, about 2 mm. in length.

On rocks.

Baltimore Co. Md., *Waters*; Great Falls, *Palmer*; Stony Man Mt., *Steele*, *Palmer*, *King*.

†† *Lateral leaves spreading.*

2. S. apus (L.) Spring.

Lycopodioides denticulatum pulchrum repens, spicis apodibus . . *Dill.* Hist. 467. t. 64. f. 2.

Lycopodium apodum L. Sp. Pl. 1105.

Selaginella apus Spring, l. c. 119. *Eaton* l. c. 698. *Underw.* in Ill. Fl. 1: 45; Nat. Ferns 141; in Britt. Man. 27. *Clute*, l. c. 155.

Plants delicate, with whitish, barely 5 mm. thick branches; leaves pellucid, light green, the lateral ones ovate, about 2 mm. in length, those of the upper and lower faces smaller, lanceolate, appressed; the upper leaves similar, crowded, enclosing the minute sporangia.

In moist, shaded places.

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Evergreens

WASHINGTON, D. C.
1908

PREFACE

There is perhaps no family of trees and shrubs of more importance to man than the Evergreens. They furnish raw materials which yield innumerable products—products of the highest importance in all the fields of man's activity. The Evergreens, besides serving ordinary uses, hold a very important place from an esthetic point of view: they add a serious aspect to a landscape: their dark-green foliage relieves the monotonous though beautiful aspect of a deciduous forest: by themselves they are awe-inspiring and have in no small degree contributed to the weird if not melancholy sagas and melodies of the Northern people: intermixed with the Oaks their influence has found expression in a more melodious and milder harmony, as characterized by the literature and music of the Celts, of Central, Western or Southern Europe.

To appreciate the influence of an ever green forest, its monotonous and weird music, it is necessary to have lived in its midst, to have wandered through it at all seasons of the year, to have seen its fresh foliage in the mild season and its snow-laden boughs in winter. What is handsomer than a White Pine, a Silver Fir, a Scandinavian Spruce, a Virginian Cedar, or a Bald Cypress as it stands in the waters with its branches laden with "Spanish Moss"?

The brief descriptions are merely for field use and in preliminary determinations of the species. For critical work the reader is advised to consult the magnificent work —Silva of North America by Professor Sargent.

In conclusion let us cite some sentences uttered many years ago by Professor I. F. Tausch: "*Unser Wissen ist Stueckwerk, und unsere Weissagung ist Stueckwerk. Wenn aber kommen wird die Zeit, wo wir in den elisaeischen Feldern botanisiren, so wird das Stueckwerk aufhoeren.*"

Ivar Tidestrom.

White clouds, whose shadows haunt the deep,
Light mists, whose soft embraces keep
The sunshine on the hills asleep!

O isles of calm! — O dark, still wood!
And stiller skies that overbrood
Your rest with deeper quietude!

O shapes and hues, dim beckoning, through
Yon mountain gaps, my longing view
Beyond the purple and the blue,

To stiller sea and greener land,
And softer lights and airs more bland,
And skies — the hollow of God's hand!

Transfused through you, O mountain friends!
With mine your solemn spirit blends,
And life no more hath separate ends.

I read each misty mountain sign,
I know the voice of wave and pine,
And I am yours, and ye are mine.

Life's burdens fall, its discords cease,
I lapse into the glad release
Of Nature's own exceeding peace.

O, welcome calm of heart and mind!
As falls yon fir-tree's loosened rind
To leave a tenderer growth behind,

So fall the weary years away;
A child again, my head I lay
Upon the lap of this sweet day.

This western wind hath Lethean powers,
Yon noonday cloud nepenthe showers,
The lake is white with lotus flowers!

Even Duty's voice is faint and low,
And slumberous Conscience, waking slow,
Forgets her blotted scroll to show.

The shadow which pursues us all,
Whose ever nearing steps appall,
Whose voice we hear behind us call, —

That Shadow blends with mountain gray,
It speaks but what the light waves say, —
Death walks apart from Fear today!

Rocked on her breast, these pines and I
Alike on Nature's love rely;
And equal seems to live and die.

Assured that He whose presence fills
With light the spaces of these hills
No evil to his creatures wills,

The simple faith remains, that He
Will do, whatever that may be,
The best alike for man and tree.

What mosses over one shall grow,
What light and life the other know,
Unanxious, leaving Him to show.

Whittier.

Key to the Genera.

Leaves linear.	
Leaves in fascicles.	*1. Pinus*, p. 72.
Leaves alternate.	
a. tetragonal.	*2. Picea*, p. 79.
b. flattened.	*3. Abies*, p. 80.
Leaves apparently 2-ranked.	
a. bluish-white beneath.	*4. Tsuga*, p. 83.
b. green on both sides.	
1. trees.	*5. Taxodium*, p. 84.
2. shrubs.	*9. Taxus*, p. 94.
Leaves awl-shaped, 5-ranked.	*Cryptomeria*, p. 89.
Leaves minute, scale-like.	
Cone-scales basifixed.	*6. Thuja*, p. 87.
Cone-scales peltate.	*7. Chamæcyparis*, p. 90.
Cones berry-like.	*8. Juniperus*, p. 92.
Leaves ample, fan-shaped.	*Ginkgo*, p. 95.

1. PINUS Plinius.

The name Pinus is of unknown origin. Linnaeus [Phil. Bot. 174.] *classes the names Abies, Juniperus, Pinus and numerous others under* "[*Nomina*] *latina obscura quorum fontes ignoramus*" *and on p. 193, he groups these names and others under* "[*Nomina*] *latina quae a Romanis recepta fuere*".

Stately trees, mostly with straight excurrent trunks. Leaves of two kinds; the primary scale-like; the secondary linear, in fascicles of 2–5. Flowers naked, monœcious; the staminate clustered, bearing numerous, spirally disposed, scale-like stamens; the pistillate single or clustered, composed of numerous imbricated scales. Ovules 2 in the axil of each scale. Fruit a cone, usually maturing in two years; the scales more or less thickened at the apex. Seed nut-like, winged or wingless.

† *Leaves in fascicles of two, rarely three.*

* *Scales of the cones tipped with slender prickles.*

§ *Leaves about 4 cm. long, rather stout.*

1. P. virginiana Miller.

Pinus virginiana binis brevioribus & crassioribus setis &c. Pluk. 1696. Alm. 297.

Pinus foliis geminis . . . . . statura humilior Gron. Fl. Virg. 190.

P. virginiana Miller, 1768. Gard. Dict. *Sargent*, 1897. Silva 11 : 123. t. 581; 1905. Man. 30. *Hough* 1907. Trees 17. ff. 16, 17.

P. inops Solander; Ait. 1789. Hort. Kew. 3 : 367.

SCRUB PINE, JERSEY- OR VIRGINIAN PINE.

Tree 10–15 m. high; branches spreading or sometimes drooping, the younger pale-green or purplish, glaucous; leaves twisted, serrulate, usually of a yellowish green color; cones 4 cm. or longer, the scales armed with slender, recurved prickles.

Forming forests throughout our region, particularly on sandy soil.

This species varies much in size according to its location much in the manner of its relative *P. sylvestris* of Europe. Along the windswept Baltic the latter species is undersized, has gnarled branches, while some miles inland it approaches our *P. Taeda* in stature.

P. sylvestris L. Sp. Pl. 1418.

Readily distinguished from the preceding species by its broader and somewhat longer leaves, its smaller cones (3 cm. or longer); the scales are armed with minute prickles. Common in cultivation.

A century ago or even later, torches were made from the Pines [*P. sylvestris*]. In Sweden at Yule-tide the church-goers, guided by crackling torches, made their way through the snow to the village church. The Yule-mass beginning long before dawn, the good people added to the weird, not always star-lit night of Scandinavia, these witch-flames, only to cast them all into a big heap—making a brilliant bonfire in the church-yard. The custom of making torches from the resinous wood of the pine is prehistoric. Even in Mythology it had its place for the poet sings of the queen fleeing to Bacchus:

"Ipsa inter medias flagrantem fervida pinum
sustinet ac natae Turnique canit hymenaeos"
Virgilius.

§ *Leaves 6 cm. or longer, very slender.*

2. P. echinata Miller.

Pinus virginiana praelongis foliis tenuioribus cono echinato gracili . . Pluk. l. c. 297.

P. echinata Miller, l. c. *Sargent*, Silva. 11 : 143. t. 587; Man. 29. *Hough*, Trees 14. ff. 14, 15.

P. mitis L. C. Rich.; Michx. Fl. 2 : 204.

YELLOW PINE.

Tree reaching a maximum height of 30 m.; leaves 1 mm. thick, grooved, dark-green in color, resembling those of *P. strobus*; cones 4 cm. or longer, 3 cm. or less in diam. when open; the scales armed with minute prickles.

In sandy soil.

** *Scales of the cones tipped with stout prickles.*

3. P. pungens Lambert. Pl. 10.

Pinus pungens Lambert; Michx. f. Hist. Arbr. Am. 1 : 61. t. 5. *Sarg.* Silva 11 : 135. t. 584; Man. 33. *Hough*, Trees 19. ff. 18, 19.

TABLE-MOUNTAIN PINE. PRICKLY PINE.

A middle-sized tree with spreading branches; bark rough and scaly; leaves 1.5 or thicker, grooved. bluish-green in color; concs ovoid, 7 cm. or longer, 6 cm. in diameter when open; scales armed with rigid, triangular, curved, 5mm. long prickles.

Scattered on the upper slopes and summits of the Alleghany Mountains.

Near Rock Creek, D. C., *Ward.* I have observed this species at Clifton Forge, Va.

*** *Scales of cones without prickles.*

§ *Leaves rather slender.*

P. resinosa *Solander*; Ait. 1789. Hort. Kew. 3: 367. *Sargent*, Silva 11: 67. t. 555; Man. 25. *Hough*, Trees 10. ff. 10, 11.

The RED PINE, so abundant and picturesque in its native region –New England and Canada– is found sparingly in cultivation. It is readily recognized by its reddish bark and dark-green leaves; cones 5 cm. or longer, 3 cm. wide when open.

§§ *Leaves rather stout.*

P. austriaca *Hoess*, Anleit. 6; Monogr. der Schwarz. Foehre, Wien 1831.

The AUSTRIAN PINE is often found in cultivation. It it readily recognized by its spreading branches, its almost blackish-green, rather stiff 15 cm. or longer leaves; cones 7–8 cm. long, 5 cm. or wider when open, scales blackish from the base to the thickened apex. It is well expressed of this singularly handsome tree:

" *Sie macht in grossen Parkanlagen, einzeln gestellt, unstreitig grossen Effect.*" *Henkel & Hochst.* Syn. Nadelh. 52. 1865.

†† *Leaves in fasicles of three, rarely four.*

* *Leaves 10 cm. or longer, rather stout.*

4. P. rigida Miller.

Pinus (rigida) foliis ternis conis longioribus squamis rigidioribus &c. Miller, l. c. *Sarg.* Silva 11: 115. t. 579; Man. 20. *Hough*, Trees 8. ff. 8, 9.

PITCH PINE.

A tree reaching a height of 20 m. or more, with spreading branches and resembling somewhat *Pinus virginiana*; leaves 2 mm. wide, of a bluish green color; cones about 4 cm. long, and as broad when open; scales armed with weak prickles.

Forming forests in places, or scattered in *P. virginiana* areas.

** *Leaves 15 cm. or longer, rather slender.*

5. P. Taeda L.

Pinus virginiana tenuifolia tripilis s. ternis plerumque ex uno folliculo setis, strobilis majoribus. Pluk. Alm. 297.

P. Taeda L. Sp. Pl. 1000. *Sargent*, Silva 11: 111. tt. 577,578; Man. 19. *Hough*, Trees 6. f. 6.

FIELD- OR LOBLOLLY PINE.

A tall tree, sometimes 40 m. or higher, with spreading branches; leaves flexible, of a light green color; cones 9 cm. or longer, 7 cm. in diameter when open; scales armed with short prickles.

Frequent throughout the eastern sections of Maryland and Virginia.

*** *Leaves 25 cm. or longer.*

6.. P. palustris Miller.

Pinus (palustris) foliis ternis longissimis &c. Miller, l. c. *Sargent*, Silva 11 : 55. t.589, 590; Man. 17.

P. australis Michx. Hist. Arb. Am. 1 : 64. t. 6.

LONG-LEAVED PINE.

A tree 20 m. or more in height, with nearly smooth branches; leaves crowded at the end of the branchlets in globe-like masses, olive green in color; cones 10 cm. or longer, 8 cm. or more in diameter when open; scales armed with short, recurved prickles.

In sandy soil. Dismal Swamp, Va.

††† *Leaves in fasicles of five.*

* *Leaves 2.5 cm. or longer.*

P. parviflora *Sieb. & Zucc.* Fl. Jap. 2 : 27. t. 115.

A medium-sized tree with horizontally spreading branches; leaves bluish green, glaucous beneath; cones about 5 cm. long, 4 cm. in diameter when open. It is often found in cultivation and is readily recognived by its rugged and picturesque aspect and by its bluish green foliage.

"Nomen japon. *Goyo no matsu* i. e. Pinus pentaphylla." *Sieb. & Zucc.*

** *Leaves about 1 dm. long.*

7. P. Strobus L.

Pinus virginiana conis longis non (ut in vulgari) echinatis, D. Banister; *Pluk.* Alm. 297.

P. Strobus L. Sp. Pl. 1001. *Sargent*, Silva 11: 17. tt. 538, 539; Man. 4. *Hough*, Trees 2. ff.

WHITE PINE.

A tall, handsome tree, 30 m. or higher, with a straight trunk and branchless to within a short distance of the top where it forms a tufted head; when free to branch (in cultivation) it produces stout, ascending branches, resembling much *P. austriaca*; leaves less than 1 mm. thick, of a dark bluish green color, very flexible; cones 10 cm. or longer, 4 cm. or more in diameter when open; scales without prickles; young branches very smooth and of a dark, iron gray color.

Alleghany Mountains.

** *Leaves 2 dm. or longer.*

P. chylla *Loddiges*, 1836. Cat. 50; *Endl.* Syn. Con. 145.

Pinus excelsa Wall. not *Lam.* Fl. Fr. 2: 202.

The WEEPING PINE, is a native of the Himalayas where it reaches a height 45 m. (fide Parlatore). It is readily distinguished from *P. Strobus*, to which it is closely related, by its pendent branchlets and longer leaves. This species flourishes in our region. I have observed it in several parks in Washington, D· C

2. PICEA Link, 1830.

The name is of classic origin and appears to have been applied to the Northern Spruce (Picea excelsa).

Forest trees with straight excurrent trunks. Leaves alternate, linear, tetragonal in cross-section, sessile or short-stalked. Flowers naked, monœcious: the staminate on branchlets of the preceding year: the pistillate terminal, composed of numerous persistant, imbricated scales, subtended by small bracts. Ovules 2 in the axil of each scale. Fruit a pendulous cone, maturing the first year. Seed nut-like, winged.

1. P. rubra (Du Roi) Dietr.

Pinus Mariana rubra Du Roi, Observ. Bot. 39. 1771; *Sargent*, Silva 12: 33.
Picea rubra Dietr. Fl. Berol. 2: 795. 1824.
P. rubens Sarg. l. c. t. 597. Man. 41.

RED SPRUCE.

Tree 20–35 m. high; branches spreading or drooping; branchlets pubescent; leaves slender, 12–15 mm. in length, acute, dark green with a yellowish tinge; cones 2–4 cm. long, of a red-brownish color, deciduous; the scales rounded, entire or nearly so.

Forming forest on slopes and summits of the high mountains in Maryland and Virginia.

"*Picea montes amat atque frigora, feralis arbor et funebri indicio ad fores posita ac rogis virens, . . . Plin.*

P. excelsa (Lam.) Link. Pl. 11.

Pinus Abies L. Sp. Pl. 1002. 1753.
P. excelsa Lam. Fl. Fr. 2 : 202. 1778.
Picea excelsa Link, Linnæa 15 : 517. 1841.

This handsome spruce, native of Northern and Centr. Europe is found extensively in cultivation : it is readily recognized by its symmetrical, pyramidal outline, its long pendulous branchlets and its 10–15 cm. long cones.

3. ABIES Plinius.

The name Abies appears to be the classic name for Abies pectinata DC. (Pinus Picea L.). Plinius refers his Abies to the "Ελατη" of Theophrastus.

Forest trees (shrubs at high elevations) with straight, excurrent trunks. Leaves alternate, linear, flat or tetragonal, short-stalked. Flowers naked, monœcious : the staminate axillary : the pistillate (on the upper branches) composed of numerous imbricated, deciduous scales, subtended by bracts. Ovules 2 in the axil of each scale. Fruit an erect cone, maturing the first year. Seed nut-like, winged.

* *Bracts shorter than the cone scales.*

1. A. Balsamea (L.) Miller.

Pinus Balsamea L. Sp. Pl. 1002. 1753.
Abies Balsamea Miller, Dict. ed. 8. *Sargent*, Silva 12 : 107. t. 610 ; Man. 58.

BALSAM FIR. BALM OF GILEAD FIR.

Tree (shrub at high elevations) 10–30 m. high; bark smooth, grayish (in younger trees), brownish (in older ones), marked by transverse balsam chambers: leaves 15 cm. or longer, obtuse or sometimes emarginate, dark green above, pale or bluish-white beneath, somewhat 2-ranked: cones dark-purple, 6–12 cm. in length, 2–3 cm. in diam.

Mt. Rogers, Va., *Small.*

** *Bracts exceeding the cone scales.*

2. A. Fraseri (Pursh) Poiret.
Pinus Fraseri Pursh, Fl. 2: 639. 1814,
Abies Fraseri Poiret, Encycl. Suppl. 5: 35. 1817.
Sargent, Silva 12: 105. t. 609; Man. 57.

This species is closely related to the preceding one; it is recognized by its cinnamon-red bark (grayish in old trees), its somewhat shorter, emarginate leaves: cones dark-purple, 5–7 cm. in length, 2 cm. in diam.; bracts yellowish-green, reflexed.

Mt. Rogers, *Small.*

I have observed this species in Eastern Tennessee.

A. pectinata (Lam.) DC.
Pinus pectinata Lam. Fl. Fr. 2: 202. 1778.
Abies pectinata DC. Fl. Fr. 3: 276. 1815.

The Silver Fir of Europe is often found in cultivation. It is readily recognized by its blunt, dark-green, 2–3 cm. long and somewhat 2-ranked leaves.

A. Nordmanniana (Steven) Link.

Pinus Nordmannia Steven, An. Sc. Nat. II. 11 : 56. 1839.

Abies Nordmanniana Link, in Spach, Hist. Veg. 11 : 418. 1842.

This handsome species, a native of Crimea, is cultivated extensively. It is recognized by its blunt, shining, bright-green, emarginate, 2.5–3 cm. long many-ranked leaves.

A. Cephalonica Loud.

A. cephalonica Loudon, Arbor. Britt. IV : 2325. ff. 2235–2236.

This handsome tree is readily recognized by its dark-green, acute or mucronate, squarrose, 2-- 3 cm. long leaves.

"'Es ist diess die 'wilde Ceder' der Griechen. Diese schœne Tanne ertrægt unsere Winter ohne allen Schutz und gehœrt ohne Zweifel zu den schœnsten Nadelhœlzern, welche unsere Gartenanlagen zieren, da sie in ihrer ganzen Tracht und der Regelmæssigkeit des Wuchses einer Araucaria entfernt æhnelt".

Henkel & Hochstetter.

4. TSUGA Carr. 1855.

Tsuga is apparently the Japanese name for Abies Tsuga Sieb. & Zucc. Inu-tsuge is given as the name for Ilex crenata and Tsuga-zakura for Phyllodoce taxifolia. Kaempfer [Amoen. 5 : 781.] *mentions two species of Tsuge: "Ojo, vulgo Tsuge, Buxus arborescens, folio ovato" . . and "Tsuge altera, Chamæbuxus minor," &c.*

Trees with straight, excurrent trunks and, slender, horizontal branches. Leaves alternate, flat, apparently 2-ranked, bluish-white beneath. Flowers naked, monœcious : the staminate in globose clusters : the pistillate terminal. Ovules 2 in the axils of each scale. Fruit a pendulous, ovoid cone. Seed winged.

* *Cones 1.2–2 cm. long.*

I. **T. canadensis** (L.) Carr.

Abies minor pectinatis foliis, Virginiana, conis parvis, subrotundis, . . a D. Banister e Virginia transmissa est . . . Pluk. Alm. 2 1696. Phyt. t. 121. f. 1.

Abies foliis solitariis &c. . Gron. Fl. Virg. 191.

Pinus canadensis L. Sp. Pl. 1421. 1763.

Tsuga canadensis Carr. Conif. 189. 1855. *Sarg.* Silva 12 : 63. t.603. Man. 48.

HEMLOCK.

Tsuga canadensis.

Tree 18–30 m. in height: bark red-brown or grayish: leaves stalked, 1--1.5 cm. long, bright-green, shining, obtuse: cones 1 cm. or less in width; scales suborbicular. nearly entire.

Frequent on slopes, in ravines and along water-courses. —Western Maryland and Virginia.

** *Cones 1.5–2.5 cm. long.*

2. T. caroliniana Engelm.

T. caroliniana Engelm. in Bot. Gaz. 6: 223. 1881. *Sarg.* Silva 12: 69. t. 604. Man. 49.

HEMLOCK.

. . "Smaller, stouter branched than *T. canadensis*, from which it is always readily distinguished by its larger, darker, glossier, more retuse leaves and its larger cones with wide spreading scales. . . *Engelm.* l. c.

Little Brushy Mt., and slopes Farmer Mt., Va., *Small*, *Vail.*

5. TAXODIUM. Richard, 1810.

Trees with straight trunks and horizontal or drooping branches. Leaves of two forms—scale-like and linear-lanceolate, 2-ranked. Flowers monœcious; the staminate in globose clusters, forming panicles; the pistillate aments ovoid, scattered near the ends of the branches. Ovules 2 in the axil of each scale. Fruit a globose cone maturing the first year. Seed angular, winged.

1. T. distichum (L.) Richard.

Cupressus americana Park. Theatr. 1476. f. 2. 1640.

Cupressus virginiana Tradescanti Ray, Hist. Pl. 2: 1408. 1688.

Cupressus virginiana, foliis acaciæ cornigera paribus & deciduis. Pluk. Alm. 125; Phyt. t. 85. f. 6.

Cupressus foliis distichis patentibus . . Gron. Fl. 153.

C. disticha L. Sp. Pl. 1003. 1753.

Taxodium distichum Rich. An. Mus. Par. 16: 298. 1810. *Sarg.* Silva 10: 151. t. 587. Man. 71.

BALD CYPRESS.

Tree sometimes 45 m. high, with a very broad base and distinguished by its conic knees, arising from the roots: leaves 1.2–2 cm. in length, acute, yellowish green. Upland forms (as to form) resemble much a Lombardy Poplar.

Frequent in swamps in Eastern Maryland and Virginia.

. . "The Cupressus disticha stands in the first order of North American trees. Its majestic stature is surprising; and on approaching it, we are struck with a kind of awe, at beholding the stateliness of the trunk, lifting its cumbrous top toward the skies; and casting a wide shade upon the ground, as a dark intervening cloud, which, for a time excludes the rays of the sun. The delicacy of its color, and texture of its leaves, exceed everything in vegetation. It generally grows in water, in low flat lands, near the banks of great rivers and lakes that are covered, great part of the year, with two or three feet depth of water; and that part of the trunk which is subject to be under water, and four or five feet higher up, is greatly enlarged by prodigious buttresses, or pilasters, which, in full grown trees, project on every side, to such a distance, that several men might easily hide themselves in the hollows between. Each pilaster terminates under ground, in a very large, strong, serpentine root, which strikes off and, branches every way, just under the surface of the earth: and from these roots grow woody cones, called cypress knees, four, five, and six feet high, and from six to eighteen inches and two feet in diameter at their bases. The large ones are hollow, and serve very well for bee-hives; a small space of the tree itself is hollow, nearly as high as the buttresses already mentioned. From this place, the tree, as it were takes another beginning, forming a grand straight column eighty or ninety feet high, when it divides every way around into an extensive flat horizontal top, like an umbrella, where eagles have their secure nests, and cranes and storks their temporary resting places; and what adds to the magnificence of their appearance is the streamers of long moss that hang from the lofty limbs and float in the winds. This is their majestic appearance when standing alone, in large rice plantations, or thinly planted on the banks of great rivers."

W. Bartram, Travels 88. 1792.

6. THUIA Camer. 1586.

θυια of Homerus [Odyss. 5, 60.] *and Theophrastus* [Hist. 5 : 5.] *is held to be Callitris quadrivalvis Vent. (Thuja articulata Vahl.).**

Shrubs or trees with spreading or ascending branches and compressed branchlets. Leaves of two kinds, awl-shaped, or minute, blunt, appressed, 4-ranked. Flowers monœcious: the staminate in subglobose or ovoid aments: the pistillate borne on lateral branchlets, in solitary and terminal aments; scales 6–8, 4-ranked. Ovules commonly 2 in the axils of the basifixed scales; the latter oval or oval-oblong. Fruit maturing the same season. Seed oblong, winged.

. . . .

* Ignis quidem in focis magnus ardebat, procul vero odor
cedrique fissilis thyaeque per insulam redolebat,
ardentium: ipsa vero intus cantillans voce pulcra,
telam obiens, aureo radeo tenebat.

. . . .

Homeri Carm. Odyss. 5, 60.

Thyum, quam alii thyam appellant, circa Ammonis fanum et in Cyrenaica nascitur, forma cupresso simile, ramulis, foliis, trunco, fructuque: vel quasi silvestris cupressus est. Copiosa etiam ubi nunc oppidum est: et ex eo memorant contignationes quasdam vetustissimas fuisse, lignum enim nunquam putredinem sentit et radix valde crispa, e qua opera pretiosissima fiunt. . . . .

Theophrasti Opera 5, 3, 7.

1. T. occidentalis L.

Arbor Vitae Gerard, Herb. 1187. f. 1597.
Arbor Vitae . . ex America Septentrionali ora, Canada dicta, delata . . Clus. Hist. 36. 1601.
Thuja occidentalis L. Sp. Pl. 1002. 1753. *Sarg.* Silva 10: 126. t. 532; Man. 74.

ARBOR VITÆ.

Tree commonly reaching a height of 15 m. or more, bark shreddy, red-brown; cones 1 cm. or less in length, about 0.5 cm. in diameter; seed about 3 mm. in length, winged all around.

Near Marion, Va., *Britton, Vail:* Natural Bridge and Alleghany Co., *Steele.*

De arbore Vitae dicta.

Ex peregrino orbe, Galliae primum aduena est facta, tempore Francisci primi Regis Franciae, & in hortos Regiae Fontanablaei, ex Canada Septentrionalis Americœ provincia illata: . . . .

Dodonæus, Hist. Stirp. 845. 1583.

. . einer Thuja (Lebensbaum) nicht unaehnlich, ist eins der gewœhnlichen Nutzhœlzer Algeriens, des Atlas und der uebrigen nordwestafrikanischen Gebirge, wird gern als Mœbelholz benutzt und wurde schon von den Rœmern als Cedernholz (Citrus) hoch geschætzt. Man fertigt aus dem wohlriechenden Holz auch Kasten zum Schutz gegen Motten. Stamm und Æste liefern aus Einschnitten in die Rinde das Sandaracharz. . .

Meyers Konv. Lex. 3: 1893.

Thuja (occidentalis) strobilis laevibus, sqamis obtusis Linn. Hort. Ups. 289. Spec. plant. 1002 was a tree which was rather frequent in Canada, but less so southwards. The southernmost place where I observed it, was a little south of Saratoga in the province of New York, ... but Mr. Bartram told me that he had found a single tree of it in Virginia by James River a little above the place, called the falls . . . .

Kalm, Resa til Nor. Amer. 3: 389. 1761.

Biota orientalis (L.) Don.

Thuja orientalis L. Sp. Pl. 1002. *Sieb. & Zucc.* Fl. Jap. 2: 31. t. 118.

The Oriental Arbor Vitæ is extensively cultivated. It differs from *T. occidentalis* by its more slender, chestnut-brown branchlets, darker green foliage, its armed cone scales and wingless, 5 mm. long seed.

Cryptomeria japonica (L.) Don.

San vulgo Ssugi Cupresso-Pinolus resinifera, fructu sphaerali, squamoso pruni magnitudinis &c. Kæmpfer, Amœn. 883. 1712.

Cupressus japonica L. f. Suppl. 421. 1781.

Cryptomeria japonica Don, Trans. Linn. Soc. 18: 2. 166. 1841. *Sieb. & Zucc.* l. c. 43. t. 124.

The *Sugi* of the Japanese is cultivated extensively. It is readily recognized by its 5-ranked, awl-shaped, decurrent, falcate-incurved, light-green leaves and its subglobular, squarrose strobiles.

7. CHAMÆCYPARIS Spach, 1842.

Trees or shrubs with brownish bark and spreading, ascending, or sometimes drooping branches. Leaves of two kinds, awl-shaped, or minute, acute, appressed, 4-ranked, glandular. Flowers monœcious: the staminate in cylindric or oblong aments: the pistillate subglobose. Ovules 2–5 in the axil of each fertile scale. Fruit globose, maturing the same season. Seed somewhat winged.

1. C. Thyoides (L.) B. S. P.

Cupressus nana Mariana, fructu cæruleo parvo. Pluk. Mant. 61. t. 345. f. 1. 1700.
Cupressus Thyoides L. Sp. Pl. 1003. *Sargent,* Silva 10: 111. t. 529.
Chamœcyparis thyoides B.S.P. Prel. Cat. N. Y. 71. 1888. *Sarg.* Man. 81.

WHITE CEDAR.

Tree 15–30 m. in height, with shreddy or scaly red-brown bark: it resembles somewhat *Thuja occidentalis*, from which it differs by its darker green, glandular foliage and its small, armed fruit.

Frons s. rami cum foliis imbricati & compressi exacte eodem modo, quo Thuja, at fructus, magnitudine baccarum juniperi, finditur ut in Cupresso.

Linnæus, l. c.

"Abundant in parts of the Dismal Swamp (Nos. 87. C. & K., 1600, 1663). Locally known as 'Juniper'."

Kearney, Contr. U. S. Nat. Herb. 5: 512. 1901.

"The White Cedar grows only in wet grounds. In the maritime districts of New Jersey, Maryland, and Virginia, it nearly fills the extensive marshes which lie adjacent to the salt-meadows and are exposed in high tides to be overflowed by the sea. In New Jersey it covers almost alone the whole surface of the swamps, of which the Tupelo and Red Maple occupy the skirts. Farther south, it is mingled with the Cypress, by which it is at length entirely supplanted. In Lower Jersey and and Maryland, the swamps are accessible only during the dryest part of the summer and when they are frozen in winter. The trees stand so thick in them that the light can hardly penetrate the foliage, and in their gloomy shade spring at every step tufts of the Dwarf Rose Bay, Honeysuckle, and Andromeda, whose luxuriant vegetation proves that they delight in dark and humid exposures.

The White Cedar is seventy or eighty feet high, and rarely more than three feet in diameter, unless, perhaps, in the great swamps which have not been thoroughly explored, such as the Dismal Swamp near Norfolk in Virginia, which is covered with this species and the Cypress. When the White Cedars are close and compressed, the trunk is straight, perpendicular, and destitute of branches to the height of fifty or sixty feet: they are observed to choose the center of the swamps, and the Cypresses the circumference."

Michx. N. Am. Sylva 3: 163. (transl. by J. J. Smith.)

8. JUNIPERUS Plinius.

The name is of unknown origin [See note under Pinus, p. 72.]. *Bauhin* [Pinax 488. 1623.] *explains the name in the following words: "Latinis Juniperus dicitur, quod juniores & novellos fructus pariat, antiquis maturescentibus" . . . . . It is doubtful if we are justified in coupling this name with the Celtic Jubar-bejne —the yew of the hill-top.*

Shrubs or trees, varying much in size and outline. Leaves of two kinds, scale-like or subulate, opposite or ternate. Flowers usually diœcious: the staminate in small, axillary or terminal, oval or subrotund aments: the pistillate composed of numerous coalescent scales. Ovules single or in pairs in the axils of the upper scales. Fruit 2–3-seeded, berry-like.

1. J. virginiana L.

Juniperus virginiana Herm. Hort. Lugd. Bat. 346. 1687. *Ray*, Hist. Pl. 2: 1414. 1688.

Juniperus Virginiana Cupressi foliis rarioribus acutis Sabinam redolens. Pluk. Alm. 201.

Juniperus foliis angustis acutis aculeatis: bacca atrocœrulea pulvere resinoso albicante tecta, ossicula tria continente. Vulgo Cedrus & Sabina vocatur . . . . Gron. Fl. 194. 1743.

J. virginiana L. Sp. Pl. 1039. *Sarg.* Silva 10: 93. t. 524; Man. 94.

RED CEDAR.

Tree sometimes 20 m. or more in height and of a pyramidal outline; bark red-brown; branches horizontal below, ascending above; branchlets slender, beset with minute, 1 mm. long, appressed acute, dark-green leaves; those of the saplings linear, sharp-pointed, sometimes 5 mm. or longer; fruit bluish, glaucous, about 5 mm. in diam.

Frequent throughout Maryland and Virginia. —This species is very abundant along the Lower Potomac River, where it adds much to the striking beauty of the shore flora.

. . . .

Et perrexit in desertum, viam unius diei. Cumque venisset et sederet subter unam juniperum, petivit animæ suæ ut moreretur, et ait: Sufficit mihi Domine, tolle animam meam: neque enim melior sum, quam patres mei.

Projecitque se, et obdormivit in umbra juniperi: . . . .

Lib. III, Reg. XIX, 4.

. . . .

Et mandebant herbas, et arborum cortices, et radix juniperorum erat cibus eorum. . . . .

Job. XXX, 4.

The *Juniperus Sanctorum* is held to be some species of *Genista* [*Genista rætam Forsk.* Fl. 214. 1775.] *Juniperus drupacea*, *J. macrocarpa*, *J. Oxycedrus*, *J. excelsa*, *J. fœtidissima* and *J. Phœnicea* are all recorded from Syria. *Cedrus Libani* is undoubtedly the "Cedar" mentioned in many places in Bibl. Sacr.

9. TAXUS Dioscorides.

The Greek equivalent is found in the works of Dioscorides. The Romans applied the name apparently to the present Taxus baccata L. Speaking of Picea Plinius adds the following: "Similis his etiamnunc aspectu est, ne quid praetereatur, taxus minime virens gracilisque et tristis ac dira, nullo suco, ex omnibus sola baccifera." . . . [Hist. xvi, 20.]. "*Nomen a* [*toxa*] *venena quia haec arbor olim venenum conficiendo inserviebat*" . . . . *Boerhaave*, Hist. Pl. 146. 1727.

Shrubs or trees, with spreading branches. Leaves linear, alternate, but twisted so as to appear 2-ranked. Flowers diœcious: the staminate axillary, scaly at the base; anthers peltate: the pistillate axillary, scaly at the base. Ovule 1, erect. Fruit berry-like. Seed ellipsoid.

1. T. canadensis Marsh.

Taxus canadensis Marsh. Arb. Am. 151. 1785.
T. baccata β. minor L. C. Rich.; Michx. Fl. 2: 245. 1803.

GROUND HEMLOCK. YEW.

A low, spreading shrub, 1 m. more or less in height; leaves mucronate, 1–1.8 cm. long, about 2 mm wide, green on both sides; fruit bright-red, 5 mm. long, open at the top displaying the black seed.

Near Luray, Va., *Steele*; Smyth Co., *Small*; Stony Man Mt., *Palmer & King*. — I have seen this species in Vermont and New York.

Ginkgo biloba L.

Ginkgo vel Gin an, vulgo Itso. Kæmpfer, Amœn. 811, f. 1712.

Ginkgo biloba L. Mant. 2: 313. 1771. *Thunb.* Fl. Jap. 358. 1784.

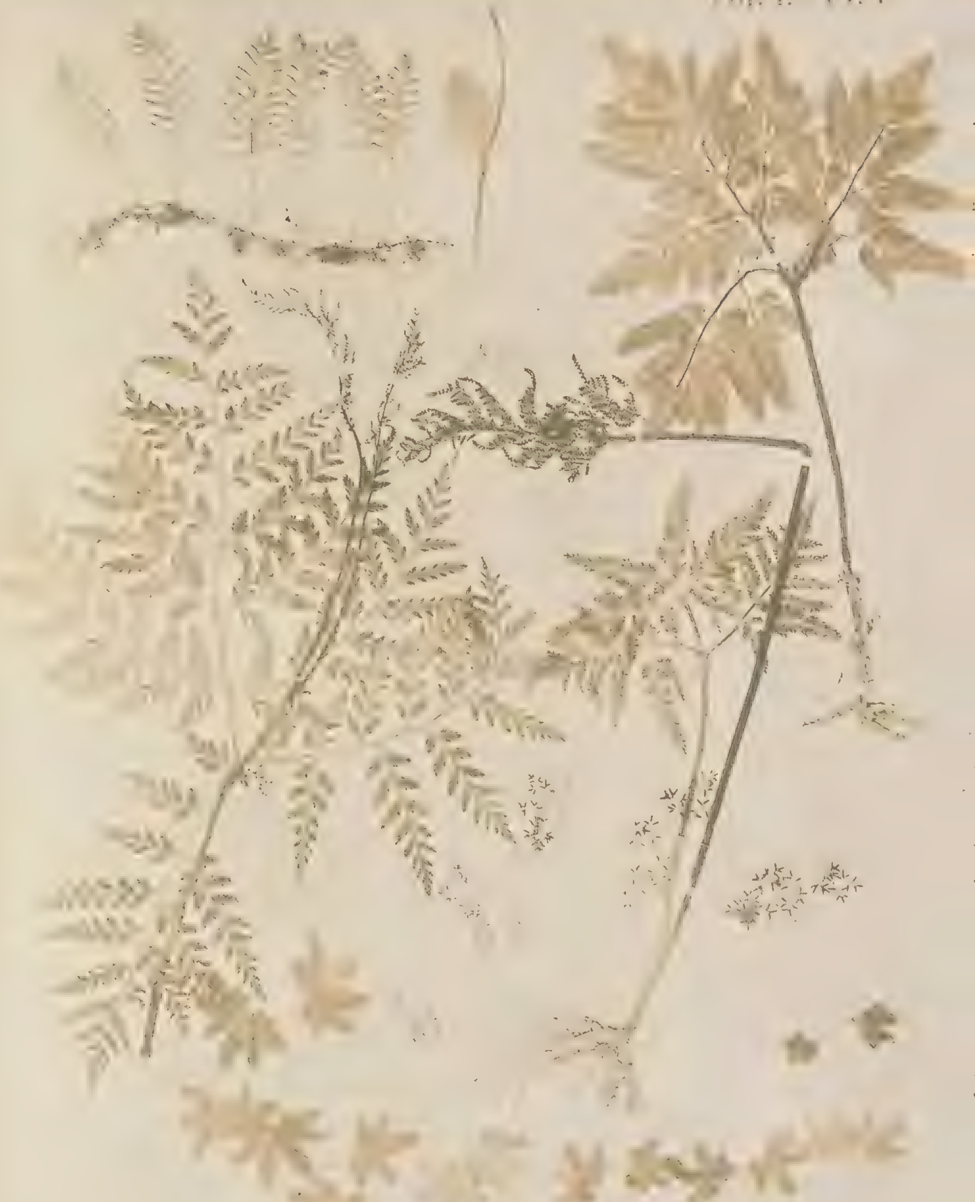
Salisburia adiantifolia Smith, Linn. Trans. 3:330 1797.

This species which is readily recognized by its long-petioled, sub-rhombic-flabelliformed, bi-lobed leaves, is found extensively in cultivation. It thrives well in our region.

"Rarior in hortis et prope templa buddhaica. . . . Pulcherrima et procerrissima arbor, saepe surculis e radice enatis, cito crescentibus, trunco contiguis, demum cum eo connatis, adaugitur. Talem arborem vetustissi-

ma, cujus historia usque ad tempora Dynastiæ Juan refertur, prope templum Tan-dshe-ssy vidi, circumferentiam 40 circiter pedum habentur, altissimam, vegetam, nullaque alia vetustatis signa ferentem, quam proceritatem."

Bunge, En. Pl. in China, 136. 1835.

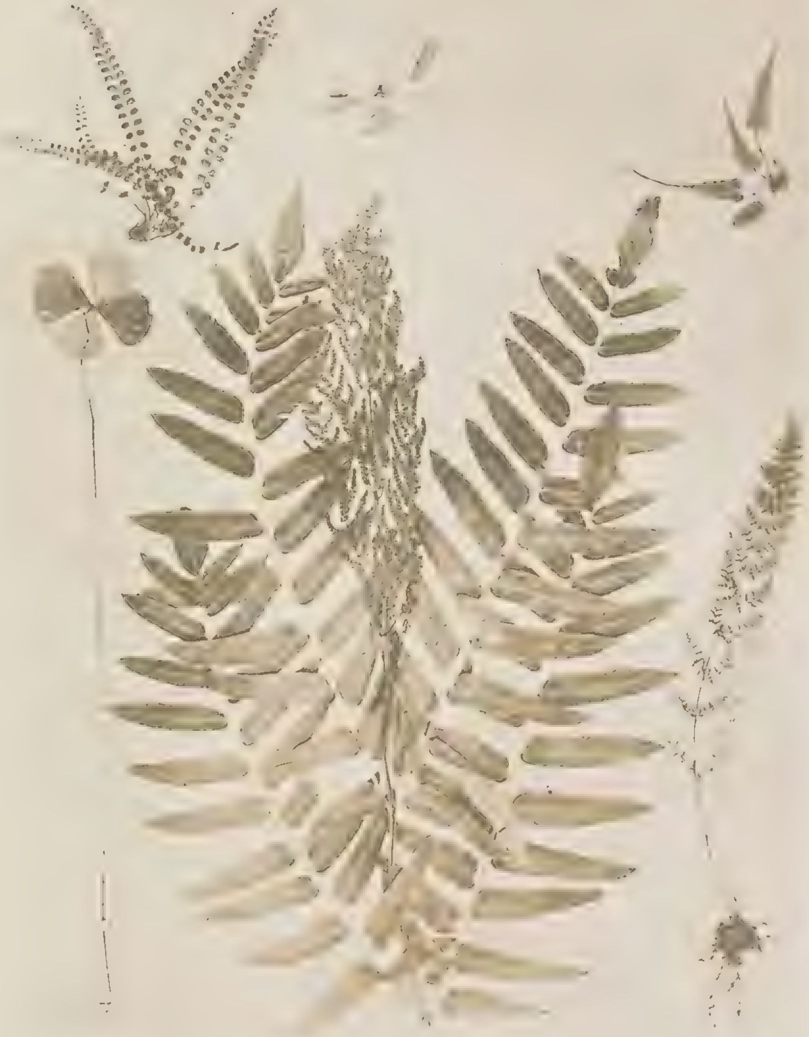


Marginaria polypodioides Botrychium obliquum

Ophioglossum vulgatum

Botrychium virginianum Botrychium dissectum

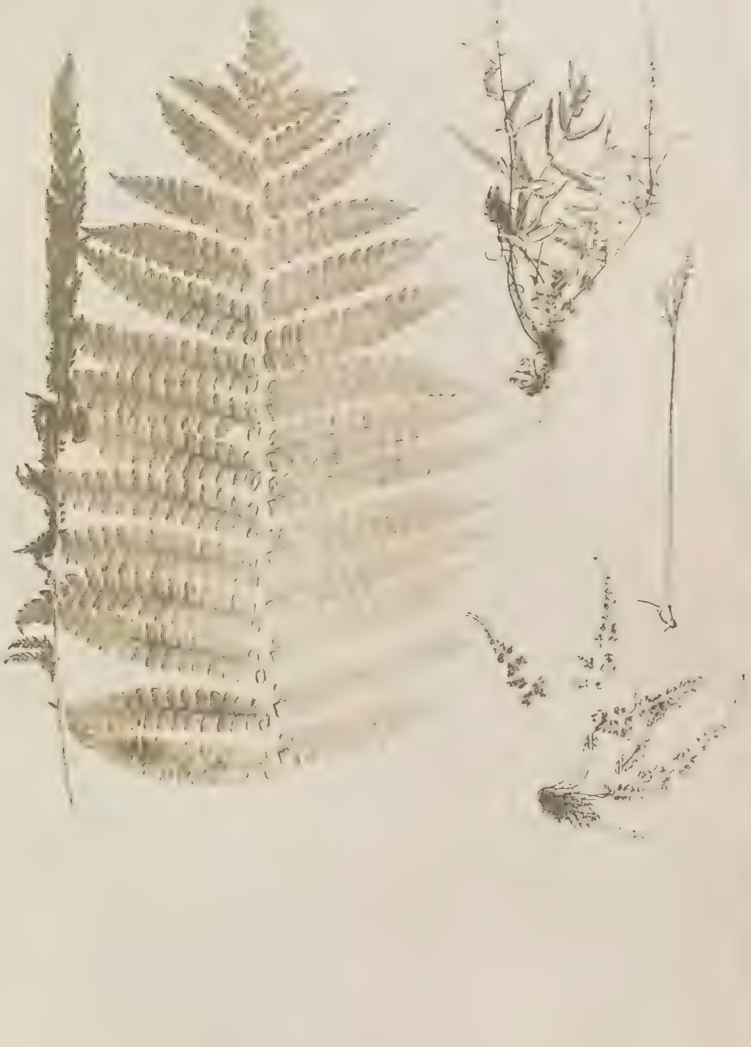
Lygodium palmatum



Aspl. trichomanes Camptos. rhizophyllus

Osmunda regalis

Marsilia quadrifolia Cheilanthes lanosa



Os. cinnamomea (*fert.*) Pellaea atropurpurea

Os. cinnamomea (*ster.*) Botr. neglectum

Asplenium pinnatifidum

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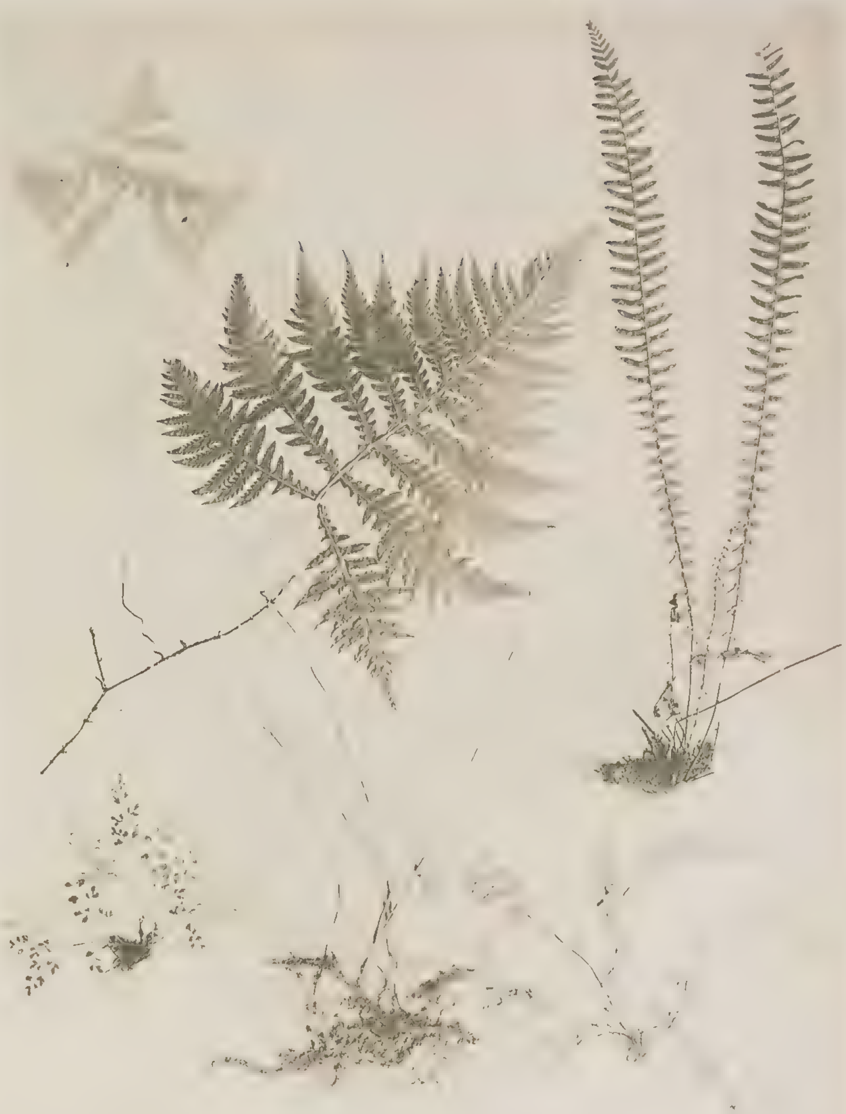
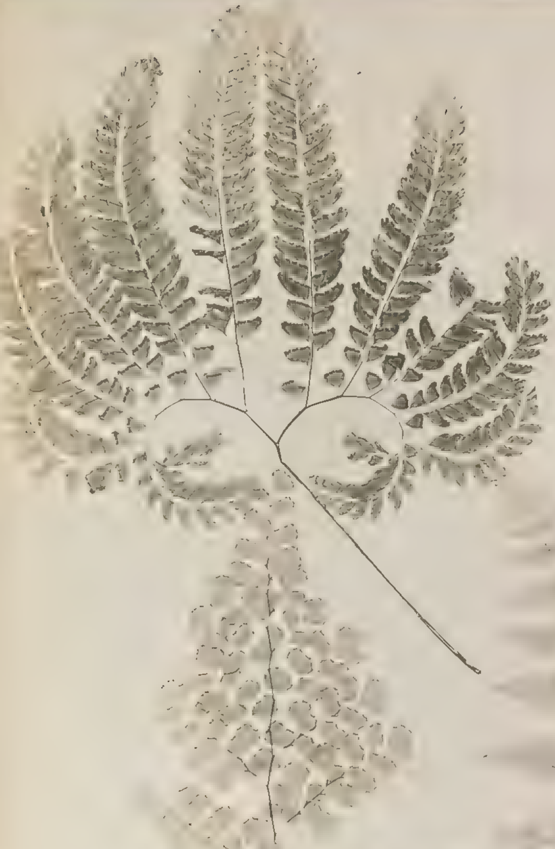


Phegopteris dryopteris Aspl. platyneuron

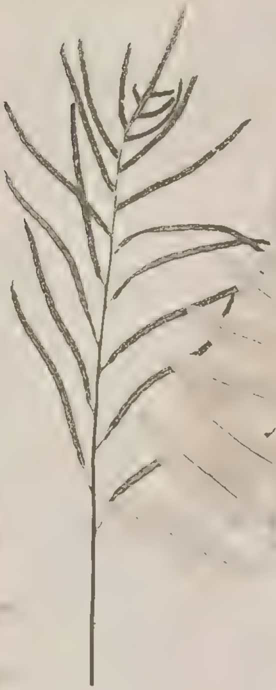
Phegopteris hexagonoptera

Aspl. ruta-muraria Aspl. Bradleyi



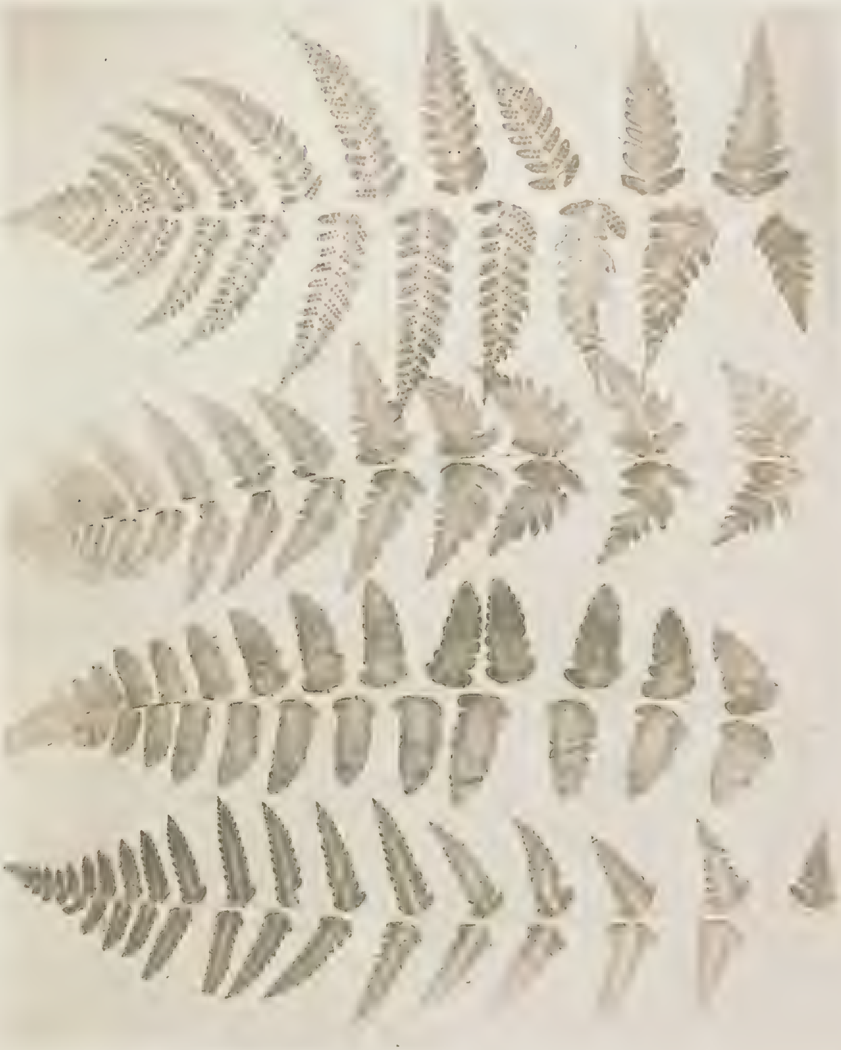
Adiantum pedatum

A. Capillus Veneris



Lorinseria areolata

Woodsia obtusa

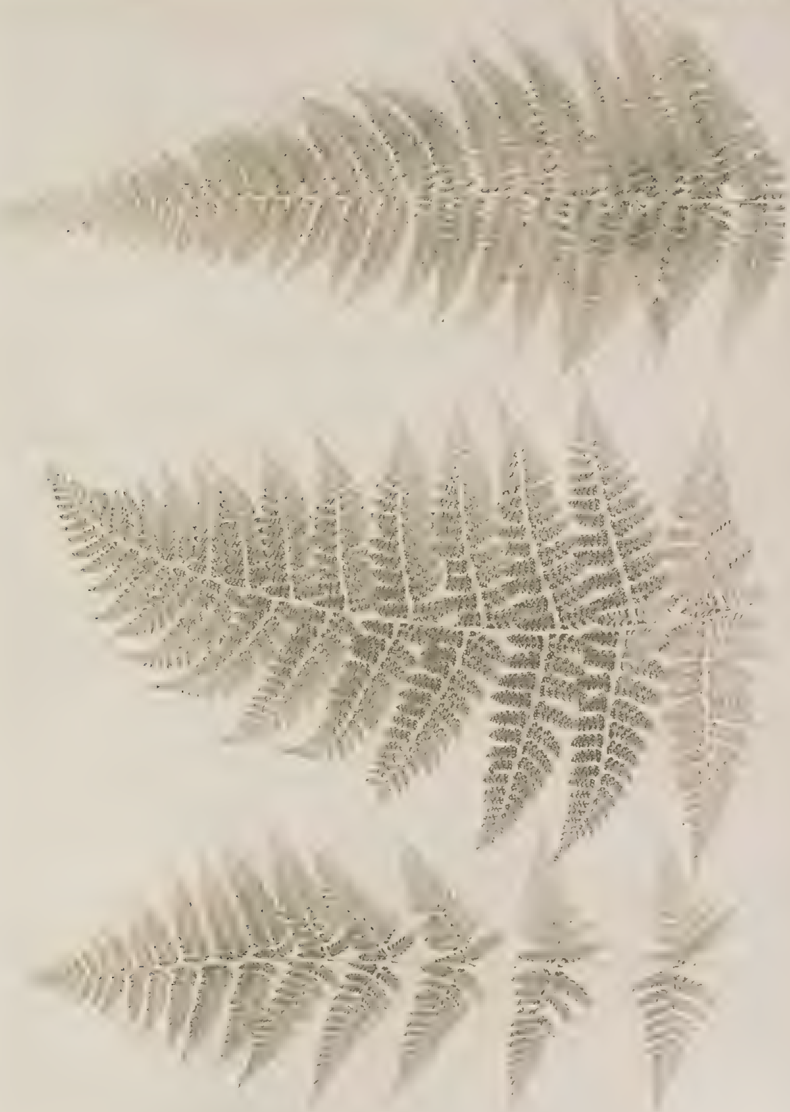


Dryopteris Clintoniana

D. cristata *(Eu. form)*

D. cristata mariana

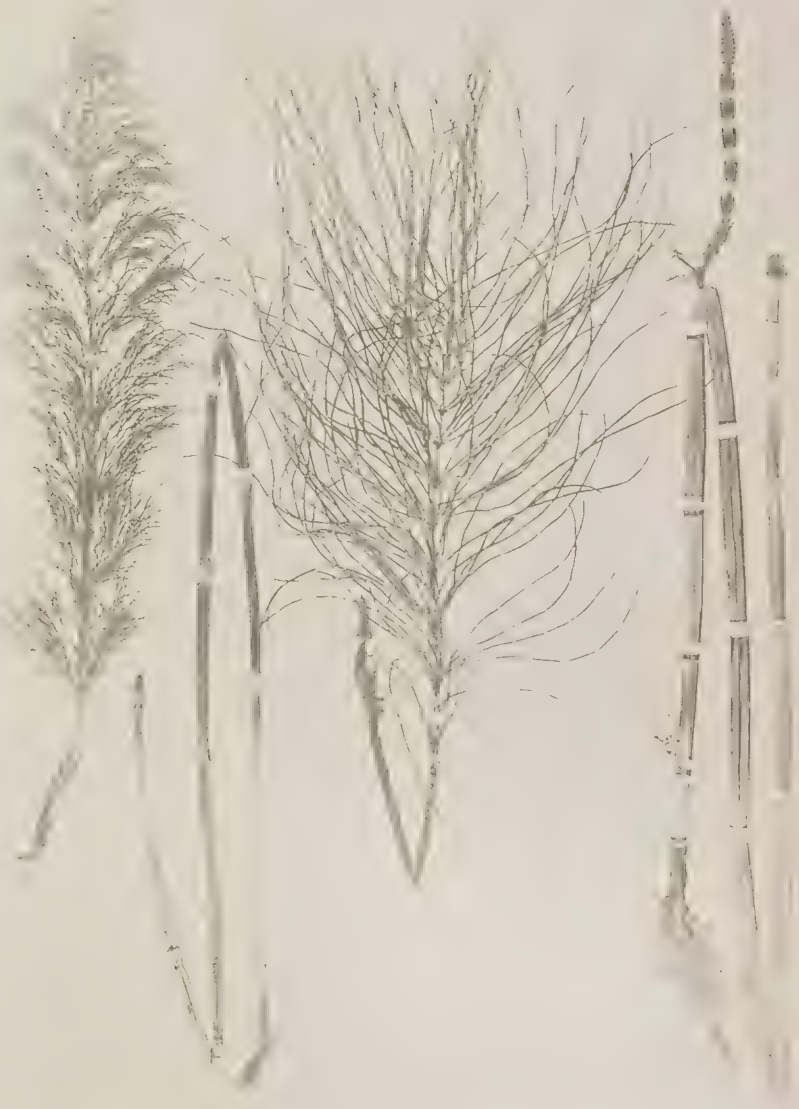
D. crist. lancastriensis



Dennstaedtia punctilobula

Dr. spinulosa intermedia

Dryopteris spinulosa



Equisetum sylvaticum E. arvense

E. arvense *(sic)*

E. hyemale E. [illegible]

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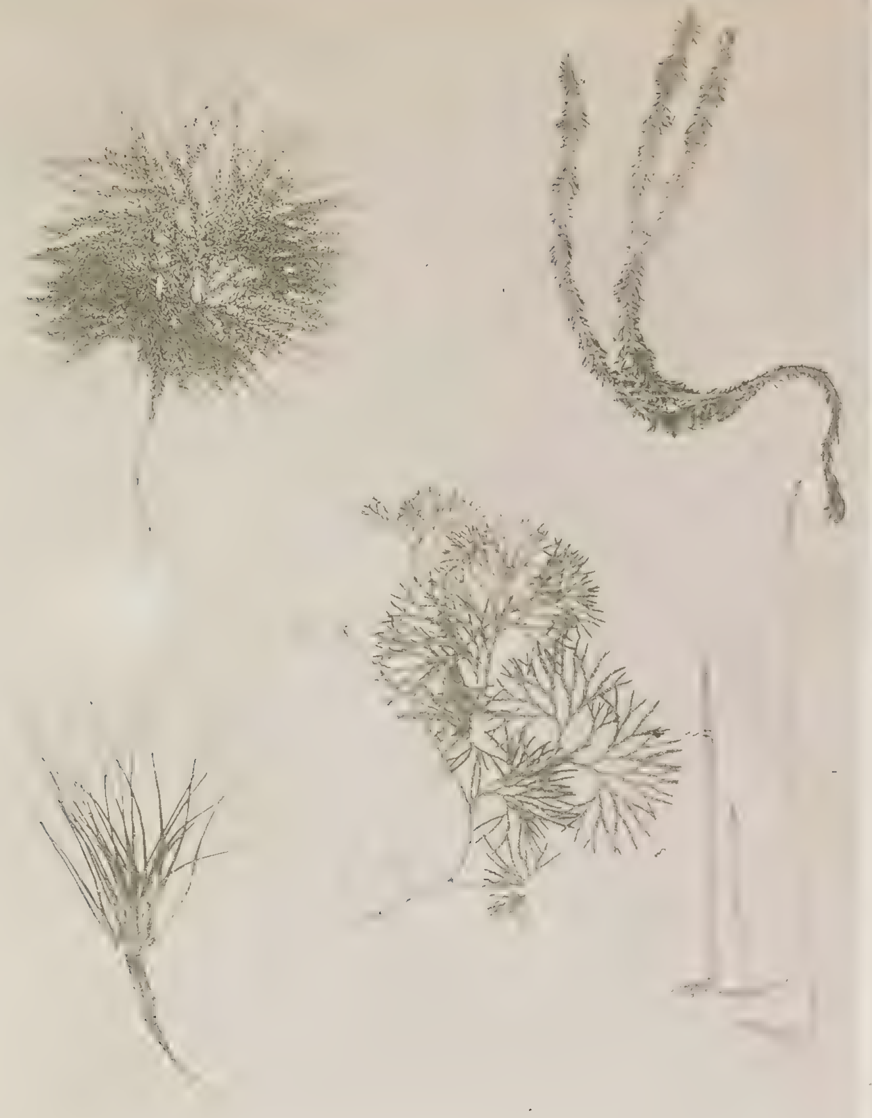
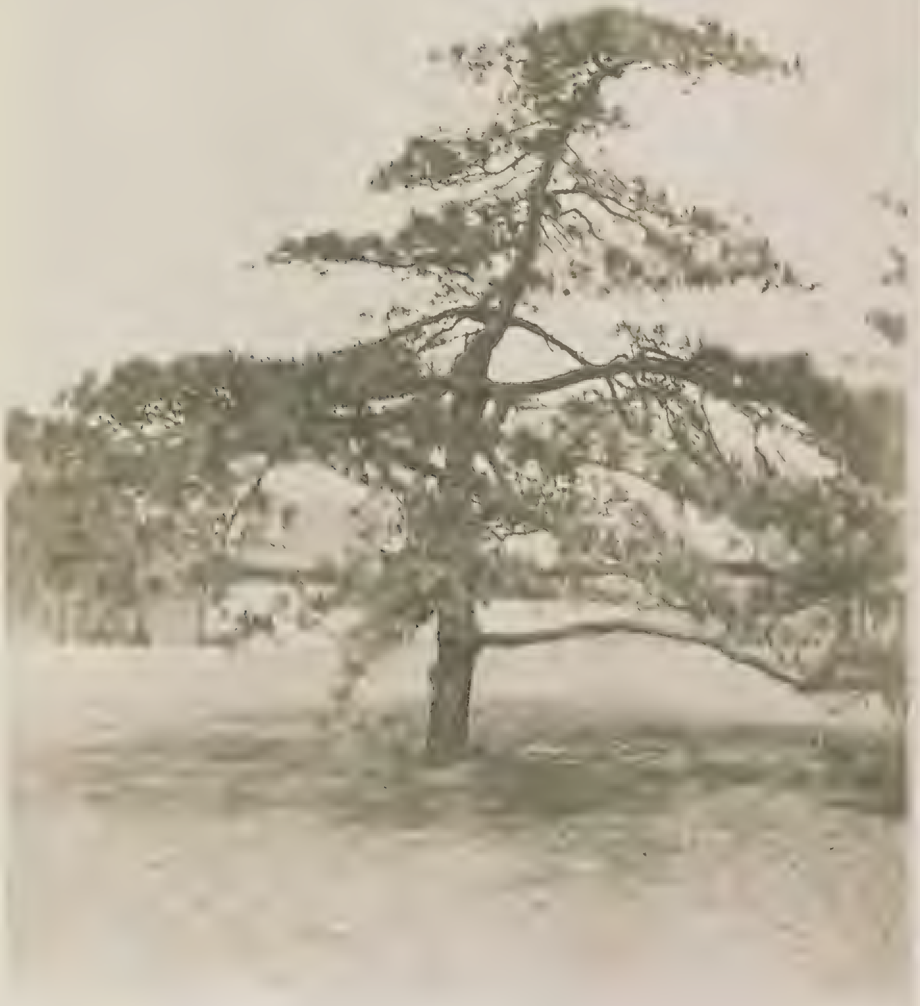


Lycopodium obscurum L. lucidulum

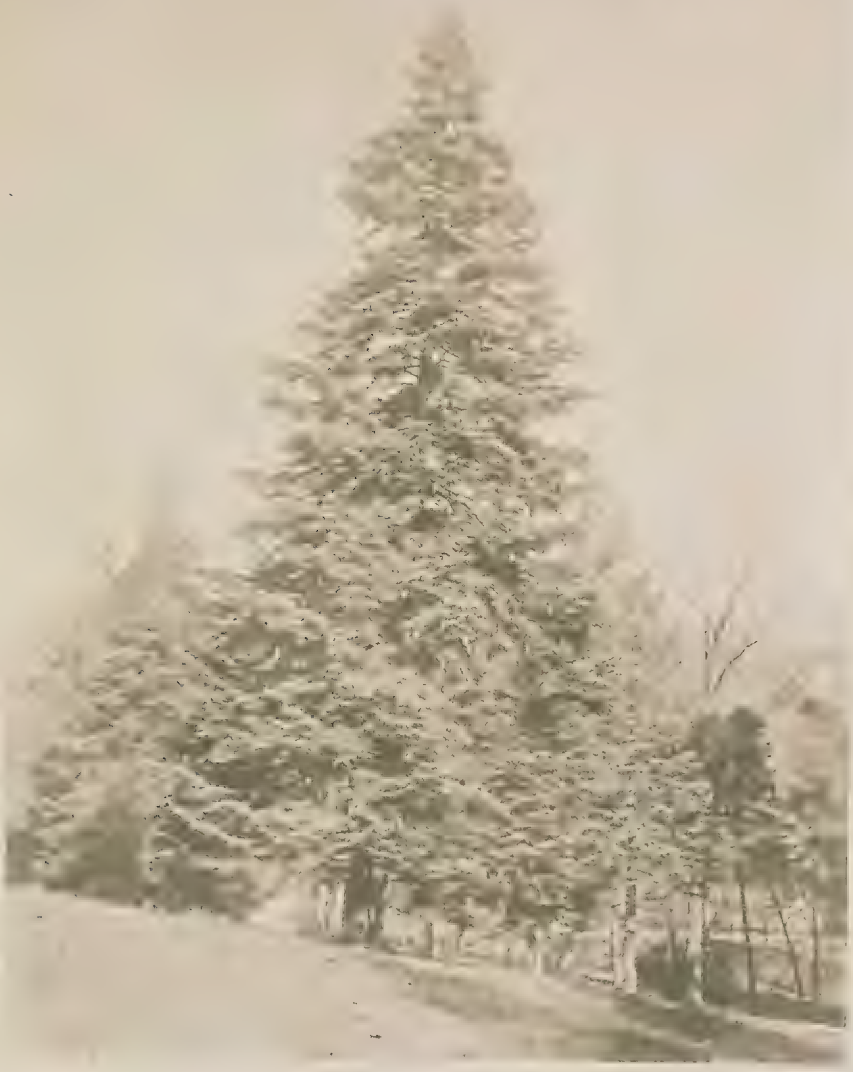
L. complanatum

Isoetes saccharata L. Chapmanii



Pinus pungens

Picea excelsa



Abies Nordmanniana

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